The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Works Organisation

THE subject of works organisation is such a vast one that it is impossible to cover the whole of it in one short article, but a paper submitted to a general meeting of the Institution of Automobile Engineers on Tuesday, January 9, deals with many points of general interest to readers of THE CHEMICAL AGE. The paper is by Mr. Cecil Kimber, a member of the Council of the I.A.E., who quite rightly points out that however much the average production engineer objects to the word "system," there really is no other word that describes so adequately the means that have to be taken to collate all the facts and figures that are necessary if the accountancy side is to provide a true weekly, monthly or yearly picture of the progress of the undertaking.

Just as the production engineer will strive to simplify the number of operations of any job, with a consequent saving in labour and material, so an organising engineer aims at simplifying and reducing the clerical operations required to provide the necessary control of the movement of material and labour employed, so that the recorded facts and figures are available to the costing and accountancy section of the works in a concise and accurate form. The author is convinced that the most important thing to be done is always to be guided by broad principles which should be laid down first and adhered to, and all the little pieces of the complicated jigsaw puzzle, to which the modern works can be likened, fall naturally into place. The functions of all the various departments or individuals should be clearly defined, and personalities or individual ability must not cause a departure from this principle.

The author proceeded to give details of various systems or methods that can be used for controlling the activities and collecting the necessary data with the minimum of clerical effort. Just as labour operations are studied to cut out waste effort and conserve physical energy, so any system introduced should be studied in a like manner to conserve mental and clerical effort. They should be devised to operate smoothly and automatically.

One of the most important sections of the production side, says Mr. Kimber, is an efficient progress department. Methods of recording progress are legion, but subject to an efficient material control, this does not present undue difficulties if suitable provision is made. Turning to the accounting department, the author says that in the average works this department is much maligned, but he is sure that if the purely works side of the factory only appreciated how much the labour of the accounts side is lightened if only it is provided with accurate details, and could realise how very much work the accounts department has to face when these accurate details are not forthcoming, then a little more sympathy and understanding would be extended to the works' accountants.

One very important function of the accounts department is the providing, at the beginning of every financial year, of a budget, in spite of the fact that such a budget can very easily be upset by an unexpected excess of sales or an unexpected drop in orders. Budgetary control is, however, of inestimable value in the control of a works and invaluable to the various departmental managers. Even such a simple thing as keeping each department advised as to how much they save on, or exceed, their budgetary allowance for telephone can produce extraordinary economies when put into effect.

Another interesting point made by Mr. Kimber was that the post of maintenance or plant engineer was an important position that should only be held by a very trustworthy man, as he was responsible for dealing with a very large portion of the expenses that go to the running of a factory. A final point made by the author is of general interest. This refers to the service spares department and relates to the abolition of annual stock-taking and the introduction of two perpetual stock checkers, who, in addition to checking over a given number of stores each day, also check daily every item of stock that is reported by the stock record section to have reached minimum stock figure or lower.

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NOTES AND COMMENTS

Water Pollution Research

THE annual report of the Water Pollution Research Board for the year ended June 30, 1939, has just been issued by the Department of Scientific and Industrial Research. In an introductory statement the Board calls attention to the importance of adequate methods of treatment of waters, for public supply, which are in any way liable to pollution, and of frequent collection of samples for chemical and bacteriological examination. Greater vigilance is required in protecting existing and future sources of water supply from undue contamination by the discharge of polluting substances. The Board points out that these measures are especially necessary during war-time, when there are movements of large numbers of people from one district to another. Research carried out under the supervision of the Board includes investigations on the treatment of water for domestic and industrial purposes and the treatment and disposal of sewage and trade effluents.

Base-Exchange Water Softening

THE process of base-exchange is used for softening water in household water softeners; it is also used on a large scale at some water works. The base-exchange materials available for this purpose include natural glauconites, treated clays, synthetic zeolites, certain synthetic resins and materials prepared from carbonaceous substances, such as coal. Of these materials, natural glauconites and treated clays have not hitherto been produced on a large scale in this country. Previous work under the Board has shown that satisfactory base-exchange substances can be obtained by treatment of fuller's earth, which occurs in large amounts in Great Britain. Further work has been done on the examination of British minerals for the preparation of base-exchange materials. One of these minerals, a glauconitic sand, from a Surrey brickworks, has a high base-exchange capacity and appears to be a suitable raw material for a base-exchange zeolite for water treatment. Other work on the base-exchange process has included the investigation of the effect of temperature on the base-exchange capacity of a number of representative base-exchange materials. Within the limits 4 to 20° C., temperature has no significant effect on the exchange capacity of any of the materials tested.

Avoiding Industrial Waste

LORD McGOWAN, President of The National "Safety First" Association (Inc.), has issued a message stressing the importance of wastage of man-power. It has been said, he points out, that the issue of the present war will be largely determined in British factories. Whether in supplying the vastly expanding needs of the war machine or in maintaining the volume of export trade, upon which financial strength depends, industry has a vital rôle assigned to it. It is, therefore, extremely important that every kind of wastage should be avoided and that there should be the greatest possible conservation of resources. In war-time, when the urgency of production is the primary goal, there is a tendency to overlook many forms of industrial waste, and above all that most alarming form of industrial waste—accidents. The disorganisation which results from an accident in the works retards production and renders impotent, even if only temporarily, valuable man-power. It is, therefore, more than ever necessary to take all possible measures to prevent accidents. Sir Duncan Wilson, H.M. Chief Inspector of Factories, has pointed out that every person injured in industry is a loss to the nation's resources, just as much as if the injury were sustained on the field of battle, and also that the circumstances which make accidents more likely have been intensified by war conditions. Such factors as the dilution of labour, the advent into industry of workers unused to factory conditions, the increased rate of production and the inevitable amount of monotonous work, all add to the difficulties. Firms which have undertaken, in conjunction with the National "Safety First" Association, an effective safety campaign, have testified that this results in reduced costs as well as more efficient working. Modern war calls for national efficiency, and on our efficiency depends our national security. Not only on humanitarian grounds, therefore, but for the maintenance of the efficiency of our nation's resources, the appeal is made to all concerned in industry not to relax their efforts to prevent accidents.

Night Blindness in Germany

ACCORDING to the Rotterdam correspondent of *The Times*, the German Press has been turning its attention to the problem of night blindness, which has become not only increasingly apparent in the black-out, but also more prevalent as a result of the war. During the Great War some German prisoners in France were suddenly attacked by the disease, but recovered when they were removed to a prison camp where the food was better. Vitamin A is suggested as the remedy, but as this vitamin occurs most frquently in those foods which are most difficult to procure in Germany at present—liver, milk, butter, eggs, cheese, and fresh fruit and vegetables—the counsel to take more of them is merely a counsel of perfection. For the moment the demand for more vitamin A is stated to have been met by the chemical industry, which has produced a substitute vitamin possessing, it is claimed, prime value in warding off and curing night blindness.

Sulphonated Oils and Fatty Alcohols

Some Industrial Applications

By
GEORGE S. COLLINGRIDGE, B.Sc.

BY no means confined to one industry or section of industry is the application of those versatile and important materials, the sulphonated oils and the so-called sulphonated fatty alcohols. Though primarily produced as textile detergents and wetting agents, they are to-day finding many completely unrelated uses—such, for example, as basic constituents of water-soluble perfumes, soapless shampoos, bath preparations, disinfectants, insecticides, and special hand-cleansers for workmen who handle metallic salt solutions. Some of these applications refer to sulphonated oils, some to the fatty alcohols, while others apply equally to both.

The complete group of what may loosely be termed "textile soap substitutes" includes not only sulphonated oils and fatty alcohols, but also reversed (i.e. cation-active) soaps such as the sapamines, polyglycerol esters, condensation products of high molecular albumens with higher fatty acids, sulphonated naphthalenes, etc. Although these products are frequently classified together, it is not invariably their function to behave as detergents; in fact, the cation-active compounds such as the sapamines behave in a directly opposed fashion, a characteristic that enables them to be used for softening fabrics and, above all, for improving dyestuff-fixation.

In this discussion we shall confine ourselves, however, to the uses of sulphonated oils and fatty alcohols—more especially in the manufacture of toilet preparations, disinfectants and cosmetics. Dr. Herman Goodman, in his noted work, *Cosmetic Dermatology,* defines the application of these products in the following terms:

"Sulphonated castor oil—emulsifier, wetting agent, and detergent in brushless shaving cream (10 per cent.); cuticle remover (up to 25 per cent.); face creams (10 per cent.): vehicles for bath odours; solvent; skin softener; hair softeners; liquid soaps; perfume carriers.

Sodium lauryl sulphate (well-known fatty alcohol derivative)—emulsifier, preservative. Stabilises oxygenated products; excellent for oxygenated dentifrices; valuable in hair rinses and hair washes."

Castor and Olive Oils

In actual practice, the chief cosmetic applications of sulphonated castor and olive oils are to be found in water-soluble perfumes, bath oils, liquid foam bath preparations, soapless shampoos and liquid soaps. In smaller proportions, they are also used in "oil" permanent waves, hair tonics, face creams, hand creams and lotions, brushless shaving creams, skin cleansing lotions, pre-shaving lotions (as a skin softener) and—generally speaking—in all cases where a water-soluble oil is indicated. Although sulphonated olive oil has been much acclaimed in the U.S.A., because of its supposed advantages from the dermatological point of view, the "finish" of most British-made products leaves much to be desired. I have personally examined dozens of samples, and have finally come to the conclusion that a properly sulphonated castor oil, of first-grade cosmetic quality, is just as gentle in its action on the skin as sulphonated olive oil, in addition to which it is technically much superior. Some of the most important related applications of sulphonated oils are in the manufacture of cinema sprays, insecticides and disinfectants.

Apart from the sodium salt of sulphated lauryl alcohol, as referred to by Dr. Goodman, there are two other important fatty alcohol derivatives utilised in this connection: the triethanolamine salt, and the popular cosmetic emulsifying agent which consists of a mixture of a high proportion of cetyl-stearyl alcohols with a low proportion of the same product sulphated (or, more recently, phosphated). These will be referred to later.

Although Frémy described in 1831 a product obtained by mixing sulphuric acid with olive oil, subsequently termed by Runge a "sulpholeate," the real history of sulphonated oils dates back to the sulphonation of olive oil in 1846 by John Mercer. The work upon which Mercer and his collaborator Greenwood were engaged was an attempt to improve the dyeing of madder turkey reds. The extremely important sulphonated castor oil was first produced about 1870, since when sulphonation experiments have been carried out with practically all the known commercial oils and fats.

Manufacture of Sulphonated Oils

The past decade has added a great deal to the chemistry of sulphonated oils, but it has truly been pointed out that their manufacture is still largely an art. Thus, the duration and temperature of mixing play an important part in the character of the finished product; in addition to which other variable factors, such as the quality of the raw material treated and the method of finishing employed, have a decisive effect upon the suitability of the resulting oil for various purposes. And whereas quite a crude product will frequently suffice for the production of a cheap disinfectant, only the very best grades are suitable for cosmetic applications. For use in toilet preparations, a sulphonated oil should be of light colour and mild odour; its stability, approximate neutrality, and complete solubility in water are obvious essentials. Any oil that precipitates a heavy sediment of stearins, albuminous compounds, etc., is to be avoided.

It is perhaps as well to emphasise the fact that the method of washing the acid oil free from sulphuric acid considerably modifies the character of the resultant sulphonated oil. This is sometimes important from the specification point of view. In many cases the acid oil is slowly stirred with a 20 per cent. Glauber's salt solution, so as to obtain efficient mixing, but without excessive stirring. After standing for 16 to 20 hours, usually overnight, the water is drawn off, and the oil neutralised with caustic soda and finished. In other cases the acid oil is given two washes. After the first wash the oil is allowed to stand for only a comparatively short time (one to two hours) and then whatever water has separated is drawn off and a second supply of Glauber's salt solution added; after mixing it is allowed to stand overnight for separation.

Another method used is one described in English Patents 23,768, 1906, and 21,280, 1908. This consists of running the acid oil mixture not into a Glauber's salt solution, but into a solution of caustic soda or potash of such a strength as to neutralise almost all the free sulphuric acid. The combination of sulphuric acid with caustic soda produces the necessary sodium sulphate required for efficient separation, and the oil is neutralised much more accurately than is the case when simply washed with a Glauber's salt solution. After mixing with the caustic alkali solution, the mixture is allowed to stand overnight in the usual way. This procedure gives a standard method of washing not obtainable by any other method, and helps to remove one of the variables, which can and does, in many cases, spoil a sulphonated oil. Sulphonated oils washed in this way are fast to weak and strong acetic acid, nor do they precipitate as readily with lime and magnesia salts as the sulphonated oils washed with Glauber's salt solution only. For a fuller discussion of

sulphonation methods, the reader is referred to A. E. Sunderland's "Sulphonated Oils" (*Soap*, U.S.A., October, November and December, 1935).

With a working knowledge of sulphonated oils in mind, we may now proceed to a discussion of their application in toilet preparations and disinfectants. In liquid soapless shampoos, sulphonated castor oil finds obvious application. It does not exert so drastic a detergent action as soap, but it tends to cleanse the hair effectively, leaving it soft, smooth, glossy and free from any noticeable deposit of lime soap scum. Because of its mildness, it leaves some of the natural oil in the hair, and the lustrous appearance of the latter may be still further enhanced by the inclusion in the formula of a little mineral oil. Certain types of sulphonated oil will take up quantities of mineral oil much more readily than others.

Sulphonated Oil Shampoos

The chief disadvantages of sulphonated castor oil shampoos are (a) they frequently tend to be of a "sticky" character and (b) they are non-foaming. Many attempts, some of them largely successful, have been made to overcome these problems. Thus sulphonated olive oil, in the approximate ratio of 1:3 has been suggested for admixture with the sulphonated castor. Castor oil is, however, much more difficult to sulphonate than olive oil and, as I have already pointed out, most of the treated olive oils on the market are not yet satisfactory for cosmetic use. Far better practice is the adjustment of the *p*H of the shampoo (in dilute solution, ready for use) to about 7.0 or 7.5. This gives the finished shampoo the optimum of clarity and neutrality, and also results in a non-sticky product with a sufficiently heavy body.

The addition of about 1 or 2 per cent. oleic acid or ethylene glycol has been advocated as a desirable stabilising agent for sulphonated oil-mineral oil shampoo. This should not, however, be necessary if an appropriate sulphonated oil is selected and the mineral oil content kept to a bare minimum. Experiments could also be carried out with a view to replacing the mineral oil with a small proportion of some more dermatologically satisfactory lubricant, such for example as oleyl alcohol or the so-called refined sperm oil.

The problem of producing a lathering or foaming effect is much more difficult. Saponin has unfortunately not proved very useful in this connection, in addition to which it may cause subsequent deterioration of the shampoo. The incorporation of fatty alcohol sulphates is more satisfactory, although this naturally increases costs. Janistyn advocates the admixture of sapamines, which may also be utilised on their own, as in the following formula: Sapamine citrate 15 per cent., boric or lactic acid, saponin, and glycerin 1 per cent. each, and 82 per cent. of 10 per cent. alcohol. A small proportion of the difficultly soluble but readily lathering sulphonated naphthalenes might also be tried in the sulphonated oil type of shampoo.

Cloudiness, fermentation, and precipitation are liable to occur with sulphonated oil shampoos, unless due care is taken in the course of manufacture. Enzyme fermentation should be guarded against by the inclusion of a suitable preservative, while the inclusion of suspect substances such as caramel and cudbear should be strictly avoided. The water used should be free from organic impurities. Incidentally, chilling of the finished shampoo before filling into bottles is imperative, so that the appearance of the product is not likely to suffer during cold weather.

One of the chief applications of sulphonated castor oil is in bath oil concentrates and water-soluble perfumes. From the chemical point of view, these are essentially similar in character—the sulphonated oil being simply admixed with about 10 to 20 per cent. perfume essence and small proportions of glycerin, diethylene glycol, etc. The perfume compound should be selected not only for maximum solubility, but also for its olfactory and chemical compatibility with the sulphonate. Some delicate and suave perfumes are quite "lost" in a sulphonated oil base, while others, of a sharper and bolder character, stand out quite well. Perfumes of a resinous nature may cause cloudiness and sedimentation. The use of sulphonated oil as a "filler" or extending agent in liquid foam bath preparations will be referred to in the section dealing with fatty alcohol sulphates.

Janistyn, Jannaway, Krings and others have referred to the advantages of incorporating not more than 5 per cent. sulphonated oils in liquid soap formulæ, in order to afford some resistance to lime soap formation and (much more important) to prevent progressive precipitation and thus act as effective finishing and clarifying agents.

Excellent disinfectants and insecticides may be produced with the aid of second-grade sulphonated oils. Such products usually exhibit increased uniformity and stability, as compared with soap emulsions; and they are, in addition, in an extremely fine state of dispersion, a factor that tends to increase their effectiveness from the germicidal and insecticidal point of view. The use of turkey red oil as a "spreader" for insecticides is demonstrated by the following basic formula: Pyrethrum extract (15 per cent. in acetone) 10 kg., derris extract in acetone (containing 8 per cent. rotenone) 10 kg., neutral turkey red oil 80 kg. To be applied in 1 per cent. aqueous dilution.

Active antiseptics for incorporation in a sulphonated oil and water base include many high R.W. coefficient essential oils, isolates and synthetics. Utilising merely essential oils and isolates, a typical formula may, for example, be evolved on the following lines: Tea tree oil 8 per cent., thymol 5, cinnamon leaf oil 3, sassafras oil 2, origanum and clove oils 1 per cent. each; with 50 per cent. "seconds" sulphonated oil and 30 per cent. water. In his work on Aqueous Solutions of Volatile Oils, Dr. Adrien Albert, of Sydney University, has found that "ammonia-finished concentrated turkey red oil" is extremely effective, one application being shown in the following formula for solubilised eucalyptus oil: Eucalyptus oil 40 per cent., strong ammonia solution 6.5, and ammonium ricinoleo-sulphate to produce 100. This gives a soluble, pale amber fluid, similar to glycerin in viscosity.

Fatty Alcohol Sulphates

Although cetyl and stearyl alcohols are used in perfumery as water-in-oil emulsifiers, it was discovered some time since that the salts of certain esters of these fatty alcohols (notably the sulphuric and phosphoric esters) gave oil-in-water emulsions and were themselves neutral in character. One of the most popular types of modern cosmetic emulsifying agents is that which can roughly be described as a partially sulphated or phosphated (about 10 per cent.) cetyl/stearyl alcohol mixture. This is a whitish wax of melting point approximately 50° C., neutral, free from fatty acids, fats and other impurities, and self-emulsifiable in water to form o/w emulsions. It can also form o/w emulsions of a very large number of oils, fats and waxes. Its trade name is derived from the popular lanette wax, which is somewhat loosely described in the "Pharmaceutical Pocket Book" as a synonym for cetyl alcohol. The following experimental formulæ for (1) day cream and (2) night cream are typical of the application in cosmetics of this important fatty alcohol emulsifying agent:

1. Partially sulphated cetyl/stearyl alcohol	11 g.
Stearic acid	6
Titanium dioxide	1
Cetyl alcohol	1
Mineral oil	3
Glycerin	8
Water	70

2. Partially sulphated cetyl/stearyl alcohol	15 g.
Wool wax	0.5
Arachis oil	8
Witch hazel extract	20
Citric acid	0.3
Glycerin	5
Water	51.2

A small proportion of lecithin (not exceeding 2 per cent.) may also be added to such night creams as No. 2. Both formulæ require the addition of a suitable perfume compound and about 0.2 per cent. or less of a preservative such as thymol, isothymol or one of the esters of *p*-hydroxybenzoic acid.

The partially sulphated or phosphated fatty alcohol

emulsifiers have also been successfully utilised in the manufacture of "acid" creams (e.g., lemon cream), powder creams, hair conditioning preparations, baby creams, pharmaceutical salves and ointments, hair creams, bleaching and astringent creams, etc. Owing to their neutrality and stability, they are extremely versatile and effective in use.

In quite a different category, though equally interesting, are the sulphated high fatty derivatives, such as sodium and triethanolamine lauryl sulphate. These are of widespread utility as soapless detergents, owing to the fact that they possess many of the properties of soap without any of its well-known disadvantages. In the field of cosmetics and allied preparations they have so far been used chiefly as bases for soapless shampoos and foam bath preparations, although various authorities have suggested their incorporation in the following products: cleansing creams and beauty milks (about 1-3 per cent., to improve the detergent action); liquid soaps and soap base shampoos (to offset the calcium soap formation by dispersion); soap flakes and soap powders; oxygenated dentifrices (as a detergent, emulsifier and oxygen-stabiliser); and in perfumed bath oils.

As pointed out by Dr. C. A. Tyler, aqueous solutions of the alcohol sulphates possess the property of forming stable foams when agitated. Unlike soap, they have the property of forming foams readily in hard water, even in sea water. While foam-formation is not necessarily an indication of detergency, it is in the minds of many people because of the behaviour of soap. Sodium lauryl sulphate is sufficiently soluble to give good suds even in ice-water. This makes it of obvious interest as a base for foam bath preparations and soapless shampoos, formulæ for both of these specialities exhibiting—as one would expect—a distinct mutual resemblance.

Commercial sodium lauryl sulphate forms the basis of soapless shampoos and foam baths in powder form. It may be extended by admixture with compatible fillers such as dried sodium carbonate, borax, boric acid, sodium sulphate, etc. Saponin also may be added. On the other hand, liquid preparations are usually made on a basis of the triethanolamine salt, together with sodium metaphosphate, diethylene glycol, sulphonated castor oil, citric and other weak acids, gum acacia mucilage, carbitol, sorbitol, glycerin, etc.

There is also a tendency for manufacturers of raw materials to fabricate ready-made or semi-manufactured bases for foam baths and similar preparations—these bases frequently containing complex fatty alcohol derivatives and products of a similarly acting character, in association with a wide range of well chosen auxiliary and extending agents. Such bases are frequently of outstanding interest to manufacturers of cosmetics and toilet preparations.

Import and Export Regulations

Export Licences

THE Board of Trade have made an Order—the Export of Goods (Control) Order, 1940—which comes into force on January 15 and replaces the present Order and the various Amending Orders and Open General Licences issued with regard to it. The new Order is virtually a consolidation order, and the revised schedule of goods which require export licences is substantially the same in effect as the schedule now in force. It has, however, been recast into convenient groups in order to facilitate reference and the descriptions of particular items have been revised where experience has shown that exporters were in doubt as to what they covered.

In general the new list shows the present practice of the Export Licensing Department to which exporters are accustomed, and it is necessary to call attention only to the changes set out below. Exporters can satisfy themselves about particular items by reference to the booklet which contains an alphabetical index and which is obtainable from the Export Licensing Department, Inveresk House, Strand, London, W.C.2. Any inquiries should be addressed to that department or to the local collector of customs and excise. It should be understood that existing licences already in the possession of exporters are not in any way invalidated by the present Control Order.

The following changes in detail should be noted:—

METALS.—The non-ferrous metals have been grouped under a heading which, in most cases, puts them and their alloys in all unwrought forms on to List A.

Manganese and its alloys, and ores and concentrates of columbium and tantalum have been added to List A. Cemented carbide metal has been added to List B.

CHEMICALS.—The new Order provides that simple or compound radicals which are listed include all forms of the chemicals which would be covered by the introduction of recognised prefixes to the radical such as "ortho," "meta," etc.; that where any amino or other basic organic compound is included its salts are also included; and that mixtures consisting of prohibited substances or of a prohibited substance or substances with an inert material either in dry form or in solution require to be licensed for export.

The following chemicals have been added to the list:—Colchicine and its preparations; ergometrine, ergotamine, ergotoxine, hydrastine, hyoscine and lobeline and their salts and preparations thereof; hyoscyamine and its salts; preparations of atropine, caffeine, emetine, ephedrine, quinine and quinidine and their salts; preparations of phenacetin. The coal tar products and intermediates which require licences have now been listed separately by name.

Compounds of tantalum, titanium, tungsten and vanadium have been added to List A.

The control on the export of bleaching powder and borax has been relaxed; licences will only be required in the case of certain destinations, i.e., Bleaching Powder, List B. Borax, List C.

Gum kauri, artificial graphite and varieties of seedlac, sticklac and shellac have been added to List A.

Exports from Belgium

The *Moniteur Belge* of December 24 contains a decree which subjects to permit, as from December 27, 1939, the exportation from, or transit through, Belgium of the following:—

Graphite; crude magnesia; crude or refined borax; metallic arsenic; metallic antimony; cadmium; magnesium; simple bodies, not elsewhere specified or included, for industrial or laboratory use; anhydrous ammonia; butane, isobutane, propane or their mixtures; oxide of magnesium; oxides and anhydrides, not elsewhere specified; hydrochloric acid; oleic acid; stearic acid; caustic soda, crystallised or refined; chrome alum, and other alums not elsewhere specified; acetate of lime; basic carbonate of magnesium; salts of silver; nitrobenzene and nitrobenzols, essence of mirbane; nitrotoluene; dimethylaniline; naphthalene; phthalate of butyl and ethyl; ethylene glycol; tetrachloride of titanium; glycol; oxides of copper; oxide and protoxide of uranium; lampblack and mineral black; varnishes, lacs and siccatives, etc.; charcoal absorbents; platinum; and most qualities of copper, nickel, zinc, lead, tin and aluminium.

Exports from France

The French *Journal Officiel* of December 24 contains a decree which adds to the list of goods subject to export restriction as follows: Tartrate of lime; tartaric acid; potassium and sodium tartrates.

Silica Gel as Moisture Preventer

Keeping Goods Dry in Transit

SEALED containers have been found to offer inadequate protection to goods in transit which may be damaged by moisture. Mr. R. L. Hockley, in last December's issue of *Chemical and Metallurgical Engineering,* proposes the use of silica gel to furnish the additional dehydration that is needed.

An extended study of the subject has been made by The Davison Chemical Corporation, of Baltimore, Maryland, with whom Mr. Hockley is associated. A number of little understood but extremely important factors have been investigated. The results clearly indicate that actual direct drying of the atmosphere inside packages is often the only way to secure protection of goods which can be damaged by rust, mildew and mould, or other moisture-caused damage.

Corrosive action on most materials occurs not only in the presence of water but in the presence of relatively moist air as well. Generally an atmosphere must be maintained below 40 per cent. relative humidity, preferably as low as 30 per cent., to protect against corrosion of iron and steel and the formation of mildew, mould, and the like.

It is not enough to have the atmosphere inside a tight container dried within these normally safe limits at the outset of shipment. If such a container cools down during transport, the resulting interior condition may be serious, even when the initial atmosphere seemed dry enough. Consider a container packed at 20° C. and 30 per cent. relative humidity: if cooled to about 10° C., the relative humidity increases to 63 per cent.; and if further chilled to 3° C. or cooler, the original air of 30 per cent. humidity becomes completely saturated, and water vapour begins to condense on the surfaces of packed objects.

Many containers for goods that can de damaged readily by water contain parts or packing materials which are virtually water carriers. Paper, many types of loose packing material, and even the wooden cleats or blocks inside a packing case, contain moisture in amounts varying according to the conditions to which they have been exposed before use. In nearly all cases such packing materials carry into a container so much water that after it is closed the humidity of the atmosphere rises above the safe 30 per cent. humidity limit. Thus, without a suitable drying agent, even if the container were wholly impervious to moisture vapour or were sealed hermetically, it is not at all certain that the goods inside will be free from moisture damage.

Highly Adsorptive Material

The investigations made have utilised a form of silica gel which is now marketed under the trade name Protek-Sorb The material, with its remarkable capacity for adsorption, is neither deliquescent nor corrosive. Its action is physical rather than chemical and it is therefore ideally suited to this application. Normally, the gel is prepared in small muslin bags of sizes suitable for various sorts of closed containers. The quantity of gel used depends both on the size of the package to be protected and the extent of moisture vapour exposure to be expected. The gel absorbs up to 45 per cent. of its own weight of water from saturated atmospheres. Thus but a small quantity is required to effect and maintain a 30 per cent. relative humidity in well made containers.

Samples of this material have been utilised under various test conditions in the laboratory to determine the degree of protection against moisture damage to polished steel surfaces. Other studies have been made in sample containers exposed outdoors for considerable periods of time. The results obtained showed that:

1. Activated silica gel will rapidly reduce the moisture content in sealed packages.

2. The necessary low relative humidity inside such packages can be so maintained over considerable periods even when the packing materials give off moisture slowly, or when moisture ingress takes place because the container is not perfectly tight against water vapour.

3. Moisture damage to steel surfaces in sealed containers wil not occur when relative humidities are maintained in the neighbourhood of 30 per cent. at atmospheric temperatures encountered during shipment.

4. Most packing materials normally considered watertight are not tight against water vapour. The moisture penetrates through such wrapping materials by diffusion through the substance itself, often by apparently dissolving in the wrapping material on the outside, and evaporating inside the container.

5. Hermetically sealed containers, owing to temperature changes in transit, require protection against the moisture contained in them at the time of closure, including both the moisture in the air and the moisture in the packing materials, or sometimes in parts of the commodity itself.

6. It is difficult to get a package tight against moisture vapour even if it appears normally waterproof. Hence protection by dehydration is needed in addition to the use of the best available sealing methods.

New American Rubber Products

"Tensolite" and "Tygon"

TWO new products of interest to the rubber industry are described in the December, 1939, issue of *The Rubber Age* of New York. One of these is "Tensolite," a preparation developed from Pliofilm, the rubber hydrochloride material which was first exploited commercially by Goodyear about 1934. The inventor, Mr. H. D. Minich, found that by applying heat, pressure, and tension, in the required degree, to Pliofilm, a change in the molecular structure took place, resulting in a material with greatly improved tensile strength. It was possible to produce the new material in sheets as thin as .0002 inches commercially, and .00008 inches in the laboratory; alternatively it could be prepared in a laminated form to considerably greater thickness—$\frac{1}{4}$ inch or more. The ultra-thin material is useful where a very fine wrapping material is required; it can also be produced in filament form. The laminated material is interesting commercially as a variety of different colours can be obtained in the layers as required.

Another synthetic rubber or rubberlike material of recent development is a modified halide polymer known as "Tygon," developed by the U.S. Stoneware Co., Akron, Ohio. Unlike natural rubber, which it is said to resemble in many physical properties, Tygon is unaffected by active oxidising agents and many of the hydrocarbons. It is completely immune to hydrofluoric acid and is practically unaffected by all the reagents which rubber resists satisfactorily. Tygon linings, in most cases, may be used at temperatures up to 88° C. For services above this temperature special precautions must be taken. A form of Tygon is also available for the production of moulded or extruded articles which must resist the attack of corrosive agents. All the compounds in this form of the material are definitely thermoplastic and exhibit elasticity to some degree. Grades used in moulded or extruded goods are so compounded that their thermoplastic tendency is not objectionable over their normal usable temperature range. Between about 15° C. and 50° C. the extensibility of Tygon compounds is somewhat less than that of an average natural rubber compound but its per cent. recovery after extension, while slower than rubber, is said to be more complete.

Scientific Workers

Permission to Volunteer for Forces

THE Ministry of Labour and National Service announces that the operation of the Schedule of Reserved Occupations is being relaxed to enable men at or above the age of reservation in scientific occupations to volunteer in approved cases for service in the Forces.

Such men have previously been able to join the Forces in their professional capacity, and the present relaxation of the Schedule is designed to enable those whose services are not required in a professional capacity in the Forces or as civilians to volunteer for other forms of service. To secure that scientific workers shall not be withdrawn from civil work to the detriment of the national interest, and that an adequate reserve of scientific workers is maintained for essential services, the Scientific Research Committee will consider applications from volunteers with a view to ensuring that relaxation is granted only in suitable cases. Any reserved scientific worker who wishes to volunteer should apply to the Ministry of Labour and National Service (National Service Department), Montagu House, Whitehall, S.W.1.

Training Britain's Youth

Free Commercial Scholarships

A PRACTICAL contribution to Lord Derby's plan for employing young men between school and military age is made by the Dunlop Rubber Company, Ltd., who announce the offer of scholarships providing free commercial training under expert supervision with a maintenance grant at the rate of £52 a year. The qualifications for preliminary consideration are: Age from 17½ to 19 years at the beginning of the course, an educational standard equivalent to that of matriculation, sound health, and British nationality. The period of the instructional course will vary in accordance with the age of the individual and will be so arranged as to permit the young man to report for military duty at the appropriate time.

"In the company's view," it is stated, "it is important that the period which immediately precedes service in the Forces should be usefully employed. Unless adequate provision is made, there will be, at the cessation of hostilities, a large number of young men with no background of even elementary business experience"

Letters to the Editor

Charcoal Manufacture in Portable Kilns

SIR,—With reference to your paragraph on charcoal manufacture in portable kilns in the issue of THE CHEMICAL AGE, published on January 6, 1940, you may be interested to know that this company has been manufacturing charcoal in this way for about three years.

We have overcome the difficulties mentioned in connection with excess volatile matter, and our charcoal is accepted as being suitable for rayon manufacture, for case hardening and for cyanide production.

As before mentioned, we have been operating this process under commercial difficulties, and we have also supplied quantities of charcoal for use as alternative fuel for motor vehicles. In this connection the users report that their experiments show charcoal to possess a number of advantages over anthracite.—Yours faithfully,

J. H. S. WATT, B.Sc.,
Manager and Engineer.
THE CHARCOAL PRODUCTION CO. (SALISBURY), LTD.

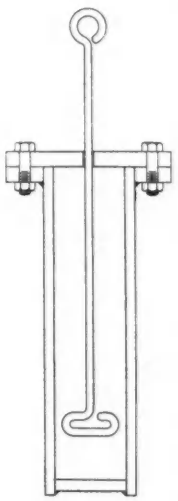
Salisbury, January 9.

Lead-Sodium Alloy

A Safe Drying Agent

LEAD-sodium alloy is reported by Mr. Harold Seroos, of the Ethyl Gasoline Corporation, Detroit, Michigan, as having been used in his laboratory for several years in place of metallic sodium for drying inflammable liquids, such as ether, because it is less hazardous to handle. Fires occasionally occur in the handling of fresh metallic sodium and in the disposal of incompletely reacted metal in contact with inflammable liquids or vapours. Lead-sodium alloy reacts only slowly with air or water, yet dries ether as completely as sodium wire. Furthermore, the residues of ether or other liquids still containing some active alloy can safely be destroyed by the addition of water, as the reaction never reaches the violence observed in the case of the metal itself. The alloy is very brittle and can, therefore, be prepared in any desired state of subdivision much more conveniently than in the case of sodium wire. The reactivity of sodium in this form also suggests that the alloy might well be considered as a substitute for pure sodium in chemical reactions where the presence of lead is not objectionable and where the extreme state of subdivision, readily obtainable with the alloy, is of material interest.

To prepare the alloy, an iron crucible is fitted with a lid through which is passed a stout iron wire which should be used as a stirrer, as shown in the diagram. The crucible is filled with 90 parts of lead and 10.5 parts of sodium and the lid is inserted. These proportions are selected to give NaPb as the product, because this sodium concentration is the lowest and safest which still provides an active, brittle material. The crucible is heated on a flame or in an electric furnace until the mass is liquid, at which time the stirrer is operated for a few minutes. The crucible is then tipped at an angle of approximately 45° and allowed to cool, after which its contents are readily removed by inverting and hammering lightly on the side and bottom. The alloy falls out in brittle lumps which can be transferred at once to an air-tight container for storage. Whenever alloy is needed for use, an appropriate amount is removed from the container, broken into small lumps in a mortar, and quickly poured into the liquid to be dried. If more rapid reaction is desired, the alloy may be ground to a fine powder; in this case it is advisable to effect the grinding under the liquid to be dried in order to minimise the absorption of moisture from the air. Finely ground powder, if not protected by the liquid, may react with excess moisture from the air sufficiently to cause the alloy to burn.



On reaction with water, the alloy disintegrates into a fine powder and the sodium is effectively used quantitatively for drying. The convenience in handling, the efficacy of use, and the safety and ease of disposal of the residues more than offset the apparent drawback of handling a large amount of otherwise inert metallic lead.

The alloy, NaPb, is made industrially as an intermediate in the manufacture of tetraethyl lead and is particularly easy to manufacture on a semi-works scale. It would seem, therefore, that if the demand would justify its production on a larger scale, it would be an easy matter for the supply houses to stock the alloy and sell it at a price which could compete with that of metallic sodium on the basis of available sodium.

Shellac Research Bureau

Annual Report of the Special Officer

THE annual report of the London Shellac Research Bureau for the financial year 1938-39, by Mr. A. J. Gibson, F.C.H., F.L.S. (Special Officer, Lac Inquiry), issued last week, contains several items of interest.

India's lac exports for 1938-39, at 642,254 cwt., showed little variation from the 1937-38 total, viz., 664,671 cwt. Button lac, shellac and other kinds (kiri) showed small decreases, while seedless showed an increase from 187,484 to 206,051 cwt. Values, as estimated by the Calcutta Customs Department, dropped out of proportion to the decrease in exports (22 per cent. as against 3.5 per cent.). Judging from the upward trend of lac exports in the last quarter of the financial year under report, it appears that the demand for lac products is being maintained, it not actually on the increase, while rock bottom as regards prices has not yet been reached, though one can now hope that this may not be the case.

In the first few annual reports of the Special Officer overemphasis was perhaps given to the synthetic resin industry and the reactions of that industry on the consumption of lac. It is now clear that the industries are more likely to develop along parallel lines rather than on convergent or largely competitive ones. Hard lac resin is now definitely a commercial proposition and is being utilised more and more for special purposes. It is estimated that the production in the United Kingdom, Europe and America is of the order of 8 to 10 tons per week. Many factors to improve its uses have still to be studied, principally the successful search for a plasticiser, the formulation of a balanced solvent mixture which has not the defects of alcohol and finally the solution of the difficult problem of getting at will the viscosities required.

Cellulose and Elastic Products

Work on the combination of lac solutions with different grades of nitrocellulose was actively pursued throughout the year. Over one hundred compositions have been examined and their properties tabulated. It has been possible to produce highly elastic materials by polymerising modified lacs. Such products have shown high electrical resistance and if the other mechanical results are satisfactory, large quantities would be utilised for insulating flexible cables.

U.S. Bureau of Mines

Annual Investigation Report

THE freeing of the United States from dependence on external sources for certain strategic minerals; the devising of processes to facilitate the utilisation of low-grade mineral deposits hitherto undeveloped; and the conservation of minerals through prevention of wastes were the main objects of study in the research programme of the U.S. Bureau of Mines during the fiscal year 1939, recently recorded by Dr. John W. Finch, director, in his annual report to the Secretary of the Interior.

Mineral industry surveys in various Western States, economic studies focussed upon mineral self-sufficiency, and metallurgical research on the treatment of low-grade ores of manganese, chrome and other metals have laid a firm foundation for investigating the possible value of domestic deposits of strategic minerals in times of emergency, a study which the Bureau was directed by Congress to make. It is proposed to examine the occurrence of ores of these minerals to determine their tenor, and to estimate mining costs so that such information will be available when required. Work has already been started on eight projects, as already recorded in this journal.

The process for making electrolytic manganese, developed and patented by the Bureau, will be applied in a commercial plant utilising electric energy supplied through the Tennessee Valley Authority. Progress has also been made in the study of methods for producing pure sponge chromium from chromium chlorides and in devising a process for the manufacture of magnesium metal from magnesites.

Comparative tests on various types of low grade coals from the West were made by the coal-hydrogenation laboratory. Owing to the demand for solid fuels of high grade, it has never been profitable to market some of these western coals. However, the reserves are so huge that, in spite of the relatively low recovery of liquid hydrocarbon from them, they offer a potential source of motor fuel. If the national petroleum output should begin to decline, the manufacture of motor spirit from this source would help to ensure a continued supply.

About one-sixth of the six million cubic feet of helium produced by the plant at Amarillo, Texas, during the fiscal year was purchased for non-Government use. Although the Army and Navy as usual bought the bulk of the output, the National Bureau of Standards used small quantities for research and the Weather Bureau contracted for delivery of about three-quarters of a million cubic feet for use in inflating small balloons.

Preliminary tests are pointing the way to utilisation of coal refuse in a number of ways; these include application in water purifying, water softening, and soil conditioning.

The remarkable progress made in the unremitting campaign for safer conditions in mining is evidenced by the fact that not a single major mine disaster occurred in the United States in the fiscal year 1939. This is the first instance of a year entirely free from mine disasters since accident statistics have been recorded.

Comparative Value of Water Softeners

Effects of Sodium Carbonate

STUDY of the comparative value of various methods of softening water has been made in Germany by Erich Heinerth, as one of the steps in the campaign to reduce the consumption of soap. Three systems are possible, he explains: the use of zeolites, the use of chemicals which will precipitate the calcium and magnesium salts, and the use of metaphosphates or polyphosphates which mask the hardness. Whereas the first and third of these systems are usable in large industrial plants, where a relatively complicated installation is possible, and where the insoluble salts produced can be filtered out, they are not suitable for the small plant or for home use. For this purpose, it is necessary to consider changing the calcium and magnesium salts into substances which will not combine with soap. It is with this last group of methods that Heinerth has experimented. Most interesting, he finds, is ordinary sodium carbonate, which is extremely effective. Chemically pure carbonate reduced hardness from 20° to 8°, while commercial carbonate reduced it to 3.2°. The reason for this difference, he explains, is that commercial carbonate contains a little calcite, affording a nucleus around which the precipitate of calcium salts can crystallise. An even better result was obtained by the use of a little sodium silicate with the carbonate. In small quantities, Heinerth points out, this has no harmful effect, and is, in fact, a good substitute for soap. A commercial softening preparation comprising 49 per cent. Na_2CO_3 and 8.6 per cent. Na_2SiO_3 provided a reduction of hardness from 20° to 2°. In practice, the time required to obtain this result is about 15 minutes. It is important, however, that there should be no soap or colloid (such as starch) in the water, as this prevents the soda from working. A large excess of soda is not necessary, about double the theoretical quantity required being sufficient.

PERSONAL NOTES

DR. WILLIAM LLOYD EVANS, head of the department of chemistry of Ohio State University, has been elected president of the American Chemical Society for 1941.

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MR. W. M. MACKINLAY, of Williamson, Morton, and Co., Ltd., paint manufacturers, was recently elected convener of the Paint and Oil Section of the Glasgow Chamber of Commerce in succession to MR. W. L. F. SHAW.

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MR. F. C. STEWART, chairman of Thermotank, Ltd., Glasgow, heating and ventilating engineers, and of Messrs. Kelvin, Bottomley and Baird, Ltd., scientific instrument makers and engineers, Glasgow, has been appointed a director of the Clydesdale Bank, Ltd.

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TO celebrate his twenty-five years of service with the company, MR. C. P. PERCY, chairman and managing director of Messrs. J. M. Steel and Co., Ltd., the London chemical merchants, is receiving a presentation from the staff next Monday, January 15.

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IT is announced from Canada that MGR. ALEXANDRE VACHON, formerly Professor of Chemistry at Laval University, Quebec, has been appointed Archbishop Coadjutor of Ottawa. The new Archbishop is Canadian-born and has done much towards the advance of technical education in his native country.

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SIR ANDREW RAE DUNCAN, who joined the board of Imperial Chemical Industries, Ltd. last August, has been appointed President of the Board of Trade. Sir Andrew Duncan's place as Controller of Iron and Steel has been

Sir Andrew Rae Duncan

taken by COLONEL SIR W. CHARLES WRIGHT. Sir Charles Wright is chairman of Guest Keen Baldwins Iron and Steel Company and Baldwins, Ltd., but ceased active participation in those companies when he became Deputy Controller of Iron and Steel on the outbreak of war.

OBITUARY

MR. WALTER ATKINSON, managing director of the Atkinson Dyeing Co., Ltd., Dalton Lane, Keighley, died recently, aged 69.

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MR. JASPER OLIVER HOWEY, works manager at the Turners' Works of the Midland Tar Distillers, Ltd., Queen's Ferry, died a few days ago at the age of 46.

MR. FRANK THOMAS SHUTT, C.B.E., formerly Chief Dominion Chemist in Canada and assistant director of the Central Experimental Farm, died recently at the age of 80.

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MR. GEORGE BIRRELL CRUICKSHANK, head of the firm of R. Cruickshank, Ltd., Camden Street, Birmingham, died on January 2, after more than sixty years as the controlling hand in the business. He was a pioneer in the British metal-plating and metal-finishing industries.

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THE CHEMICAL AGE regrets to have to record the sudden death, last Saturday, at Worthing, at the age of 66, of MR. WILLIAM ALEXANDER SKEEN CALDER, F.I.C., M.I.Chem.E., President of the Institute of Chemistry; a position to which he was elected at the annual meeting of the Institute last March.

Calder was born in London on October 9, 1873. He received his professional training at the Royal College of Science, the Royal School of Mines, and King's College, London. Throughout his career he was engaged in chemical industry.

Mr. W. A. S. Calder.

He was for seven years with Messrs. F. C. Hills and Co., chemical manufacturers, at Deptford, and from 1899 with Messrs. Chance and Hunt, Ltd., Oldbury, Birmingham. It was his tireless and efficient management of a Government factory at Oldbury during the last war that led to his appointment as general manager and director of the firm. He was a past president of the Society of Chemical Industry and of the Institution of Chemical Engineers and had also served on the council of the Chemical Society. At the time of his death he was a member of the Industrial Chemistry Committee of the Ministry of Labour.

A man of great ability and personal charm, he enjoyed the confidence and esteem of the profession of chemistry to whose interests he was ever ready to give valuable time and services. His sudden passing has come as a shock to a host of friends and colleagues.

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MR. WILLIAM GEORGE MACPHERSON, a well-known personality in the Scottish iron and steel industry, died recently in Glasgow. Mr. Macpherson built up, in partnership with the late Provost Frood of Motherwell, the business of the Motherwell Iron and Steel Company. He retired from this company after 1918 to take up an appointment as Glasgow representative of the United Steel Companies, Ltd., and was director and president of the Iron, Steel and Ironmongers' Benevolent Association of Scotland.

A Chemist's Bookshelf

ORGANIC SYNTHESES. J. R. Johnson, editor-in-chief. London: Chapman and Hall, Ltd. New York: John Wiley and Sons, Inc. Pp. 105. 8s. 6d.

Previous volumes of this annual publication of satisfactory methods for the preparation of organic chemicals have been extraordinary lucid and instructive, and this, the nineteenth, is no exception. A chapter is devoted to each of thirty organic chemicals including acetylglycine, benzohydroxamic acid, cyclohexylbenzene, dichloroacetic acid, ethyl hydrogen sebacate, hexamethylene glycol, iodobenzene, methyl nitrate, phenylnitromethane, and triphenylmethylsodium.

GENERAL SCIENCE FOR SCHOOLS (Part III), by F. Sherwood Taylor. London: William Heinemann, Ltd. Pp. X and 271. 3s.

This volume is the third and final part of a general science course. The author points out that two courses lie open to the writer of a text-book of general science. He may select from the wide syllabus such matters as he himself would teach—or he may include all that anyone might wish to teach and leave the individual teacher to make his own selection. This latter is the alternative Mr. Taylor has chosen, and the simple clarity with which he deals with his subjects makes the book one that should be in every school-child's library.

VARNISH MAKING. London: Oil and Colour Chemists' Association. Pp. XV and 225. 20s. for non-members.

This book mainly comprises the papers read at the Varnish Symposium of Oil and Colour Chemists' Association held at Harrogate last year. There are, however, two important additions. One is a paper on "The Occurrence and Chemistry of Agathic Acid" by Dr. Hosking who, unfortunately, had not the paper ready in time for the conference. The other addition is a specially written history of varnish-making by T. Hedley Barry. The attendance at the conference included several scientists from overseas and their contributions to the discussion are included with the papers. There is also a foreword by Dr. R. S. Morrell, one of the most eminent British authorities on varnish-making. This book is unique in that it is the first time varnish has been treated from such a wide aspect.

METALLURGICAL ANALYSIS AND ASSAYING, by J. Stewart Remington and F. L. Jameson. London: The Technical Press, Ltd. Pp. vi. and 101. 5s.

The selection of standard methods given in this book is designed primarily for assistants, both senior and junior, who may be engaged in engineering, assay office, and mines laboratories, and for the use of public samplers, mineralogists and others. It is the commendable hope of the authors that, as many text-books dealing with similar subjects are expensive, and outside the reach of most assistants employed in the industries mentioned above, this small publication will supply a much-felt want, especially among members of the junior staff. It is a pity that a number of the chemical formulæ have been wrongly rendered in print.

THE MACHINING OF COPPER AND ITS ALLOYS, issued by the Copper Development Association, London. Pp. 108.

This publication discusses the machining properties of copper alloys and summarises modern machining practice as applied to these materials. The general effect of the numerous developments in tools, materials and methods of production has been to increase the scope, complexity and importance of machining problems. Furthermore, these problems have become of general interest and concern to any engineers other than those specialists directly responsible for their solution. It is the aim of this book to promote among engineers generally a wider knowledge and appreciation of the machining qualities of copper alloys and also to serve as a book of reference as to the methods whereby these qualities may be exploited to the best advantage.

LIST OF MINES IN GREAT BRITAIN AND THE ISLE OF MAN, prepared by H.M. Inspectors of Mines by direction of the Secretary of Mines. London: H.M. Stationery Office. Pp. XVII and 332. 10s.

For the purposes of inspection under the Acts of Parliament relating to mines and quarries, Great Britain and the Isle of Man are divided into eight divisions. The areas of these divisions and the inspectors attached to them are shown in a table in this list. The list consists of divisional lists of mines under the Coal Mines Act and of mines under the Metalliferous Mines Regulation Acts, arranged according to the name of the owner, and giving the name and postal address of the owner, the name and situation of the mine, the names of manager and under-manager, number employed, minerals worked, etc., a general index of all mines, an index of all owners of mines, a separate index of all mines producing minerals other than coal (not, however, quite complete), arranged according to the mineral obtained and a county index.

New Control Orders

Dyestuffs Control

THERE is to-day a world shortage of certain foreign dyestuffs, and whilst continuous efforts are being made to increase our imports from allied and neutral countries, it must be borne in mind that valuable foreign exchange has to be utilised for their purchase.

The Controller of Dyestuffs wishes, therefore, to inform colour users that licences to acquire dyestuffs not made in this country will be granted only on the condition that such dyestuffs are reserved, as far as practicable, for the Services and for export trade. It will be necessary for users to preserve evidence of the actual use made of these dyestuffs to be available if proof is at any time required.

The dyestuffs position in Great Britain is immeasurably superior to-day to that in 1914, but the possibility of a shortage of dyestuffs for home trade requirements must be envisaged. It is, consequently, necessary to plan requirements so that the consumption of the available dyestuffs may be spread over as large a weight of merchandise as is practicable. The Dyestuffs Control Committee suggest that economy in dyestuffs may be obtained, for example, by reduction in the depth of heavy shades such as navy, nigger, bottle green and wine. The designers should also be asked to introduce paler shades in coloured woven and print designs, thus reducing the weight of dyestuffs required in the finished design. Other economies may also suggest themselves to users.

SOYA WOOL

Interesting information on the manufacture of soya wool in Japan has been given by Mr. Sakurada to the Japanese Society of Chemical Industry. The wool, he explains, is made from the glycinine of the soya, which has a chemical composition roughly comparable with that of keratin, the principal component of natural wool. About 37 to 40 per cent. of the soya is, moreover, glycinine, so that the process is quite economic. The beans are frequently used for the manufacture of oil, so that the wool can be made from oil cake normally used for cattle feed. The cake is ground up, and treated with a weak solution of sodium hydroxide. This dissolves out the proteids, which are then precipitated by acid, and the precipitate can then again be dissolved in sodium hydroxide solution and spun in the usual manner. A somewhat similar system is also used for the manufacture of wool from fish, a source of raw materials of which the Japanese have large quantities. This fish wool, Mr. Sakurada claims, is superior to any of the other artificial wools made at present, cod in particular producing a wool that is strong, soft and warm.

General News—From Week to Week

WIDNES COUNCIL has approved a plan for the erection of a turbine house extension at West Bank Power Station for the Castner Kellner Company.

THE EMPLOYEES of Messrs. John and James White, Ltd., chemical manufacturers, Rutherglen, have contributed a sum of £305 to Glasgow and West of Scotland charitable institutions during the past year.

S. BRIGGS AND CO., LTD., Burton-on-Trent, have sent a useful desk blotter with combined diary and calendar attached, which we acknowledge with thanks. Their range of chemical and process plant is prominently shown on the cover of the tear-off diary.

FIFTEEN SHILLINGS per ton increase for concentrated manure is advised by the Manchester Corporation. The reasons for the increase are the higher costs of hessian and the advance in wages in connection with bagging, mixing and screening. The standard price of this fertiliser is £4 per ton.

SIX WORKMEN EMPLOYED in the galvanising department of Messrs. Smith and McLean, Ltd., sheet bar manufacturers and galvanisers, Mavisbank Works, Glasgow, suffered burning injuries when a tank exploded at the works last week. They were taken to the Victoria Infirmary where three were detained, and the others allowed home after treatment.

DR. J. TOCHER, consulting chemist to the Highland and Agricultural Society, speaking at a meeting of the Society last week, commented on the deaths of sheep and lambs from arsenical poisoning after dipping. He said that the regulations prescribed a minimum of arsenic for use in sheep dips, but no maximum, and he intended to call the attention of the Ministry of Agriculture to the matter.

OXYGEN HAS BEEN FOUND to be the cause of the deaths of the hundreds of fish which were discovered floating on the surface of the Dee in Flintshire. Samples of the water and the contents of the bodies of a number of the fish, when analysed, were found to have been affected by the gas. It has been ascertained that an unusually large quantity of oxygen was discharged into the river in the form of effluent from a factory.

THE FIRST MEETING for this session of the London and South-Eastern Counties Section of the Institute of Chemistry will take place in the Hall of the Royal Society of Tropical Medicine and Hygiene, Manson House, 26 Portland Place, W.1, on January 17, at 5 p.m., when a lecture on plant insecticides will be delivered by Dr. J. T. Martin, B.Sc., A.I.C., of the Rothampsted Experimental Station. It is pointed out that there is ample A.R.P. accommodation at Manson House, and the moon is in the ascendant.

THE BOARD OF TRADE ANNOUNCED LAST WEEK that they had issued an order which revoked previous orders and amendments under the Trading with the Enemy Act. The new Order, which is called the Trading with the Enemy (Specified Persons) (Amendment) (No. 4) Order, directs that 578 persons (including firms and banks), carrying on business in various foreign countries, shall be deemed to be enemies for the purpose of the Trading with the Enemy Act. Of the 578 persons so specified, 89 are new additions. Eight persons who were specified as enemies before the coming into force of the new Order have now been deleted from the list of specified persons.

THE ADVANCES IN THE WAGES of male and female employees of Imperial Chemical Industries, Ltd., which were due to become effective in April next, came into operation, instead, on the first of this month (January). In July, 1939, Imperial Chemical Industries agreed to a general advance of wages to its chemical, explosives, leathercloth, paints, and quarry workers, the basis of the advance being the adoption of a minimum rate of £3 per week to adult male labour, with a corresponding advance to those whose rates were graded above the present minimum. In the case of adult females the minimum rate, it was agreed, would be raised to 36s. In addition to advancing the date on which the increases become effective, Imperial Chemical Industries have agreed to pay a war addition to the workers affected, amounting to 2s. a week for males of 18 and over, 1s. 6d. a week for females of 18 and over, and 1s. a week for males and females under 18.

AN EXPLOSION which occurred on Tuesday partially wrecked a large building occupied by a firm of manufacturing chemists in Leicester, John Richardson and Co., Ltd. Every window in the building was shattered, and many windows in private houses in streets adjoining the factory were also broken. One man was killed and four others were injured.

MESSRS. GOODLASS WALL AND CO., LTD., paint manufacturers, of Liverpool, celebrated their centenary last week with a whist drive and dance at the Grafton Rooms, Liverpool. The Lord Mayor of Liverpool (Alderman Sir Sydney Jones) attended and made more than thirty presentations to long-service employees.

THE 90-YEAR-OLD NOTTINGHAM FIRM of manufacturing chemists, Messrs. Newball and Mason, Ltd., held a sales conference on January 6, following luncheon at the Victoria Hotel. Mr. G. Havinden, who presided, remarked that it was significant that this old firm should be holding a conference in war-time with a view to improving, extending and enlarging the organisation.

MANY HUNDREDS OF CHINA CLAY WORKERS in Cornwall and Devon are to receive increased wages as a result of improved trade conditions in the industry. The agreement arrived at (subject to review later) provides for a war bonus of 3s. a week for all men, except when a smaller bonus will bring their weekly wages up to 56s., while youths and boys will get a proportionate increase. All female workers will receive a bonus of 2s. a week. The normal rate of pay for Devon and Cornwall china clay workers is 1s. an hour, and most of them work forty-two hours per week.

Foreign News

IT IS REPORTED from Paris that the bauxite deposits on Los Island (off the French Guinea coast) are to be developed.

AT THE UNIVERSITY of Colorado, a Division of Industrial Hygiene has been set up, as part of the Department of Medicine. It will deal with occupational diseases—their recognition, prevention and treatment.

THE ALCOHOL INDUSTRY of the occupied Polish territory has been taken over by the German Government. A commissioner has been appointed to take possession of the business of the Polish Alcohol Monopoly and to reorganise the industry.

A NEW EXPERIMENTAL LABORATORY for the production of cellulose of Italian raw materials, erected on the initiative of the I.R.I. (Italian Institute of Reconstruction) and the Cartiera Burgo, at Turin, has been officially inaugurated by Marshal Badoglio.

THE SALE, manufacture and consumption of coal tar and coal tar oils in Germany will in future be subject to licence from the appropriate governmental authority. Producers and dealers have already had to forward returns of the quantities produced or sold each quarter.

A BY-PRODUCT OF SUPERPHOSPHATE manufacture known as "white soot" and approximating in composition to an amorphous hydrated silica is stated to have found application in the Russian rubber industry as a substitute for carbon black. (*Chimie et Industrie*, 1939, *42*, 5, 864.)

RESINS PREPARED BY CONDENSATION of a polyhydric alcohol and an oxyacid, a typical example being glyceryl citrate, are soluble in water and have accordingly been put forward as substitutes for gum arabic in the textile and paper industries. (*Chimie et Industrie*, 1939, *42*, 5, 878.)

THE ESTABLISHMENT OF ZONES in France free from import duty, a measure agreed upon by the Minister of Trade and the Minister of Blockade, has a great importance for French industry as far as the import of raw materials is concerned. Goods introduced into the free zones are primarily destined for transit; they can be stocked there without being subject to formalities, payment of duty or requisition. The measure is important both for the supplying of neutrals with raw materials and for internal trade, as French importers can stock goods in the free zone and send them on, after a certain time, for internal trade in France. It is expected that this measure will lead not only to an increase of trade with neutrals, but also to larger purchases of foreign raw materials by French import houses.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

RECOVERY OF MAGNESIUM and like metals from alloys.—Sir J. H. Rutherford and Lancashire Metal Subliming Corporation, Ltd. 30686.

PROCESSES FOR SEPARATING and recovering the rubber and fibre constituents of unvulcanised rubber scrap containing fibrous material.—Soc. Italiana Pirelli. (Italy, Dec. 12, '38.) 30777.

MANUFACTURE OF CELLULOSE DERIVATIVES containing cellulose and nitrogen.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 9, '38.) 30737-8.

MANUFACTURE OF 1-AMINO-(4¹-OXY)-PHENYLAMINO-ANTHRAQUINONES.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 29, '38.) 31066. (Switzerland, Nov. 16.) 31067.

ALKYLATION OF PARAFFINS WITH OLEFINES.—Standard Oil Development Co. (United States, Dec. 30, '38.) 31015.

APPARATUS FOR TRANSFORMING a liquid into an aerosol by ultra-atomisation of the liquid.—V. A. Trier and Andre (Components), Ltd. 30997, 30998.

GAS PRODUCERS.—J. D. Troup. 30978.

MANUFACTURE OF SEEDLAC.—R. H. Turnbull. 30953.

PROCESS OF PREPARING purified rubber latex.—United States Rubber Co. (United States, Feb. 16.) 31016.

OIL-RESISTANT RUBBER COMPOSITION.—R. H. P. Watts, P. F. Schidrowitz and Revertex Sales Co., Ltd. 30882.

METHOD OF AND APPARATUS FOR THE PRODUCTION of aerated or gasified spray or foam.—F. W. Willis and A. Simpson. 30942.

MANUFACTURE OF PLASTIC COMPOSITIONS.—A. Abbey (Dow Chemical Co.). 31643.

PROCESS FOR THE PRODUCTION of a vegetable glucoside.—Celec Corporation, Ltd., and S. M. Phillips. 31317.

MANUFACTURE OF LUMINOUS POWDERS or pigments.—L. M. Clark, A. C. Rolfe, and Imperial Chemical Industries, Ltd. 31177.

MANUFACTURE OF INTERMEDIATE COMPOUNDS and dyestuffs derived therefrom.—Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann. (France, Dec. 23, '38.) 31311.

PLASTIC SELF-HARDENING COMPOSITIONS.—P. P. B. Cormac and Rubber Cement Products, Ltd. 31168.

MANUFACTURE OF SOLUBILISED ORGANIC COMPOUNDS.—E. I. du Pont de Nemours and Co., A. L. Fox, C. O. Henke, W. H. Lockwood, and J. M. Tinker. 31265.

MANUFACTURE OF OXYGENATED ORGANIC COMPOUNDS.—H. Dreyfus. 31517.

MANUFACTURE OF AZO COMPOUNDS.—G. H. Ellis, H. C. Olpin, and J. Wright. (Dec. 31, '38.) 31558.

MANUFACTURE OF DYES and textiles, etc., coloured therewith.—G. H. Ellis, H. C. Olpin, and J. Wright. (May 24.) 31559.

PROCESS FOR THE PREPARATION of alumina from clay or other aluminium-containing materials.—English Clays, Lovering, Pochin and Co., Ltd., R. J. Davies, H. O. Dering, and T. W. Parker, 31285, 31286, 31287.

PROCESS FOR THE COKING of petroleum residues and like materials.—A. Fisher. 31250.

MANUFACTURE OF AZO DYESTUFFS.—J. R. Geigy A.-G. (Switzerland, Dec. 2, '38.) 31228.

MANUFACTURE OF ACID SALTS of quaternary ammonium bases.—J. R. Geigy A.-G. (Switzerland, Dec. 6, '38.) 31512.

MANUFACTURE OF HYDROCARBON FUELS.—G. E. Heyl and S. Heyl. 31145.

PROCESS FOR THE CRACKING OF OILS.—A. C. Jessup. (France, Dec. 5, '38.) 31173.

PROCESS FOR THE PRODUCTION of isobutylene and its dimer.—A. C. Jessup. (France, Dec. 5, '38.) 31174.

PROCESS FOR THE MANUFACTURE of ammonium nitrate.—Montecatini Soc. Generale per l'Industria Mineraria e Chimica. (Italy, Dec. 9, '38.) 31335.

PROCESS FOR THE MANUFACTURE of 2-naphthol-1-sulphonic acid.—Montecatini Soc. Generale per l'Industria Mineraria e Chimica. (Italy, Dec. 12, '38.) 31379.

METHOD OF PRODUCING STARCH ESTERS.—Naamlooze Vennootschap W. A. Scholten's Aardappelmeelfabrieken. (Holland, Dec. 12, '38.) 31205.

EXTRACTION OF PALM OIL and similar vegetable oils.—A. Nyrop. 31296.

METHOD OF PREPARING SAPS.—A. Nyrop. 31463.

CHEMICAL SILVERING PROCESSES.—H. Schmolka. 31304.

MANUFACTURE OF ANDROSTANOLONES substituted in 17-position or derivatives thereof.—Soc. of Chemical Industry in Basle. (Switzerland, Dec. 10, '38.) 31513.

MANUFACTURE OF RESINS and coating-compositions containing such resins.—Standard Oil Development Co. (United States, Dec. 31, '38.) 31461.

PROCESS FOR PRODUCING copper base boron alloys, and oxygen-free copper base boron alloys of high electrical conductivity.—A. H. Stevens (American Brass Co.). 31275.

MANUFACTURE OF ANTHRAQUINONE VAT DYESTUFFS.—Soc. of Chemical Industry in Basle. (Switzerland, Nov. 30, '38.) 31155.

APPARATUS FOR PURIFYING POLLUTED LUBRICATING OILS.—R. Adler. 31971, 32054.

METHOD OF PRODUCING gluten powder.—Aktieselskabet Niro Atomizer. (Denmark, Dec. 9, '38.) 31988.

MANUFACTURE OF MELAMINE and its deamination products.—American Cyanamid Co. (United States, Dec. 17, '38.) 31718.

PRODUCTION OF ETHYLENE DIAMINE.—M. P. Applebey and Imperial Chemical Industries, Ltd. 32058.

PRODUCTION OF POLYHYDRIC ALCOHOLS by electrolytic reduction of reducible saccharides.—Atlas Powder Co. (United States, Dec. 17, '38.) 31842. (United States, Jan. 7.) 31844.

METHOD OF PREPARING colloidal silver iodide composition, and the product.—A. C. Barnes Co., Ltd. (United States, Dec. 10, '38.) 31908.

MANUFACTURE AND PRODUCTION OF LUMINOUS PAINTS.—E. R. Box and F. E. Kerridge. 31815.

APPARATUS FOR PROCESSING SYNTHETIC TEXTILE FIBRES.—Carbide and Carbon Chemicals Corporation. (United States, Dec. 30, '38.) 31686.

PROCESS FOR TREATMENT OF USED OILS.—Celec Corporation, Ltd., S. M. Phillips and A. Baker. 31932.

CRACKING HYDROCARBON MIXTURES.—Compagnie Technique des Petroles. (France, Dec. 16, '38.) 31987.

MANUFACTURE OF AZO COMPOUNDS.—G. H. Ellis, H. C. Olpin, and J. Wright. (May 24.) 31660.

METHOD OF HEATING and spraying viscose waxes and oils.—J. A. Ericksen. (July 26, '38.) 31841.

GENERATORS FOR PRODUCER-GAS.—G. Thornton-Jones. 31657.

APPARATUS FOR THE HEAT TREATMENT of solid carbonaceous materials.—F. Lloyd. 31892.

REFINING OILS.—Low Temperature Carbonisation, Ltd., G. S. Pound and S. R. M. Ellis. 31752.

PROCESS OF PREPARING VITAMIN B_6 and related compounds, and intermediate products made and employed in such process.—Merck and Co., Inc. (United States, Dec. 27, '38.) 32111. (United States, Dec. 23, '38.) 32112.

PROCESSES FOR DYEING with sulphured dyes.—Montecatini Soc. Generale per l'Industria Mineraria e Chimica. (Italy, Dec. 12, '38.) 32070.

PROCESS FOR THE PRODUCTION OF HYDROCARBONS.—N. V. de Bataafsche Petroleum Maatschappij. (United States, Dec. 14, '38.) 31807. (United States, May 27.) 31808.

MANUFACTURE OF PIGMENT PASTES.—Nuodex Products Co., Inc. (United States, Dec. 22, '38.) 31712. (United States, June 27.) 31713. (United States, Oct. 31.) 31714.

PREPARATION OF *d*-TARTARIC ACID.—C. Pfizer and Co. (United States, Dec. 13, '38.) 31847.

RESINOUS MATERIALS.—C. A. Redfarn. 32085.

PROCESS FOR OBTAINING CARBON DIOXIDE from flue gases.—G. T. Reich. 32013.

MANUFACTURE OF POLYMERISATION PRODUCTS.—Soc. Anon. des Manufactures des Glaces et Produits Chimiques de St-Gobain, Chauny et Cirey. (France, Dec. 13, '38.) 32071.

PRODUCTION OF ACRYLIC ESTERS and their derivatives.—Soc. Anon. des Manufactures des Glaces et Produits Chimiques de St-Gobain, Chauny et Cirey. (France, Dec. 13, '38.) 32072.

AIR CARBON ANODES.—Soc. Le Carbone-Lorraine. (France, Dec. 12, '38.) 32027.

FERTILISERS.—Soc. of Chemical Industry in Basle. (Switzerland, Dec. 20, '38.) 31701.

FERTILISERS.—Soc. of Chemical Industry in Basle. (Switzerland, Oct. 5.) 31702.

MANUFACTURE OF POLYMERS.—Standard Oil Development Co. (United States, Jan. 7.) 31997.

MOULDS.—A. H. Stevens (Aluminium Co. of America.) 31724.

PREPARATION OF MINERAL OIL COMPOSITIONS.—A. H. Stevens (Aluminium Co. of America). 31727, 31728.

PREPARATION OF ALKALINE EARTH METAL CARBONATES.—A. H. Stevens (Pittsburgh Plate Glass Co.). 31729.

SUPPLY OF PRODUCER-GAS to internal-combustion engines.—E. Stuckman. 32090.

MANUFACTURE OF EMULSION OIL.—C. Suchy. 31921.

PRODUCTION OF ORGANIC ALKALI METAL COMPOUNDS.—Tootal Broadhurst Lee Co., Ltd., and F. C. Wood. 31913.

ELECTRODEPOSITION OF METALS.—W. W. Triggs (Harshaw Chemical Co.). 32142.

PLASTIC AND COATING COMPOSITIONS.—American Cyanamid Co. (United States, Dec. 17, '38.) 32335. (United States, Feb. 18.) 32336.

MANUFACTURE OF SATURATED BRANCHED-CHAIN HYDROCARBONS.—C. Arnold (Standard Oil Co.). 32288.

DIPHENYLAMINE DERIVATIVES.—W. Baird, G. E. Scharff, and Imperial Chemical Industries, Ltd. 32515.

PREPARATION OF LACQUERS containing aminotriazine-aldehyde condensation products.—American Cyanamid Co. (United States, Dec. 27, '38.) 32337. (United States, Dec. 23, '38.) 32338. (United States, Dec. 31, '38.) 32339. (United States, Jan. 13.) 32340.

STARCH SOLUTIONS.—G. H. Briggs, Ltd., G. H. Briggs and H. Adams. 32578.

PROCESS FOR PREPARING monoarylsulph-amidothiazole derivatives.—Chinoin Gyógyszer és Vegyészeti Termékek Gyara r.t. (Dr. Kereszty and Dr. Wolf). (Hungary, Jan. 11.) 32419. (Hungary, Aug. 28.) 32420.

Complete Specifications Open to Public Inspection

PROCESS FOR THE PRODUCTION OF AMINES.—T. H. Temmler (trading as Temmler-Werke Vereinigte Chemische Fabriken H. Temmler). May 4, 1938. 28658/38.

METAL-COATED PLASTIC MATERIAL, and method of producing same. Metaplast Corporation. May 23, 1938. 4022/39.

PROCESS FOR PURIFYING CARBON DISULPHIDE.—Vereingte Glanzstoff Fabrieken A.-G. May 10, 1938. 7065/39.

PROCESS FOR THE REMOVAL of carbon monoxide from mixtures thereof with hydrogen.—American Magnesium Metals Corporation. May 7, 1938. 9206/39.

PROCESS FOR THE PRODUCTION of sinter phosphates.—Kali-Chemie A.-G. May 5, 1938.

PROCESS FOR THE MANUFACTURE of furane derivatives of the pyrazolone series.—Schering A.-G. May 10, 1938. 9848/39.

PARASITICIDE.—Rohm and Haas Co., and Cornell Research Foundation. May 6, 1938. 9940/39.

MIXTURES OF AMINO ACIDS, and processes for making same.—G. Toennies. May 7, 1938. 10546/39.

PROCESS FOR PREVENTING THE DEPOSITION of dispersed substances in paint dispersions.—Byk-Guldenwerke Chemische Fabrik A.-G. May 7, 1938. 11380/39.

PROCESS FOR IMPROVING CELLULOSE or materials containing cellulose.—Soc. of Chemical Industry in Basle. May 5, 1938. (Cognate Application 12965/39.) 12964/39.

MANUFACTURE OF CASEIN FIBRES.—I. G. Farbenindustrie. May 5, 1938. 12966/39.

MANUFACTURE OF DIHALOGENOBUTANES.—E. I. du Pont de Nemours and Co. May 2, 1938. 13128/39.

MANUFACTURE OF HALIDES of sulphonic acids.—Deutsche Hydrierwerke A.-G. May 5, 1938. 13389/39.

RESINOUS COMPOSITIONS.—Kodak, Ltd. May 4, 1938. 1330/39.

FOAM-PRODUCING DEVICES for fire-extinguishing purposes.—J. Muller. May 5, 1938. 13453/39.

PROCESS FOR THE MANUFACTURE of condensation products from trimethyl hydroquinone and halides of α, β-unsaturated carboxylic acids.—F. Hoffmann-La Roche and Co. A.-G. May 6, 1938. 13459/39.

PROCESS FOR MANUFACTURING alkaline silicates in powder form.—Floridienne J. Buttgenbach and Co. Soc. Anon. May 5, 1938. (Cognate Application, 13469/38.) 13468/39.

MANUFACTURE OF BODIES made of activated charcoal.—Deutsche Gold und Silber-Scheideanstalt vorm Roessler. May 5, 1938. 13514/39.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—I. G. Farbenindustrie. May 6, 1938. 13520/39.

MANUFACTURE OF CONDENSATION PRODUCTS.—Deutsche Hydrierwerke A.-G. May 5, 1938. 13530/39.

TREATMENT OF NITROGEN-CONTAINING MATERIALS.—Deutsche Hydrierwerke A.-G. May 5, 1938. 13540/39.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—I. G. Farbenindustrie. May 7, 1938. 13602/39.

MANUFACTURE OF CONDENSATION PRODUCTS.—I. G. Farbenindustrie. May 10, 1938. 13895/39.

MANUFACTURE OF SODIUM HYPOSULPHITE.—I. G. Farbenindustrie. May 10, 1938.—13896/39.

CEMENT FOR UNITING METAL and ceramic elements.—R. Bosch Ges. May 11, 1938. 10578/39.

TREATMENT OF LIGNIN, and the products resulting thereform.—E. C. Sherrard and E. E. Harris. May 10, 1938. 13085/39.

METHODS OF AND APPARATUS FOR forming rubber articles from latex.—Firestone Tyre and Rubber Co., Ltd. May 12, 1938 13358/39.

PRODUCTION OF TAR and solid low-temperature carbonisation coke.—I. G. Farbenindustrie. May 7, 1938. (Cognate Applications, 13585-7/39.) 13584/39.

SYNTHETIC RESINS, and articles made therefrom.—Norton Grinding Wheel Co., Ltd. May 7, 1938. (Cognate Applications, 13665-6/39.) 13664/39.

PROCESS AND APPARATUS FOR PRODUCING acid alcoholic liquids.—J-G. Stein Komm.-Ges. fur Alterung und Veredelung von Alkohol. May 13, 1938. (Cognate Applications, 13710-1/39.) 13709/39.

DEOXIDATION AND DEGASSING OF STEEL.—Rochling 'Sche Eisen- und Stahlwerke Ges. May 7, 1938. 13768/39.

CONCENTRATION OF ACIDS.—Hercules Powder Co., Ltd. May 10, 1938. 13854/39.

MANUFACTURE OF ESTERS OF OXYALKYL AMIDINES.—Soc. of Chemical Industry in Basle. May 11, 1938. 14058/39.

MANUFACTURE OF DYESTUFFS.—Soc. of Chemical Industry in Basle. May 12, 1938. (Cognate Application 14060/39.) 14059/39.

MANUFACTURE OF THIOFORMAMIDE COMPOUNDS.—I. G. Farbenindustrie. May 12, 1938. 14099/39.

MANUFACTURE OF AMINO-ACID AMIDINES.—Soc. of Chemical Industry in Basle. May 11, 1938. (Cognate Application, 14057/39.) 14056/39.

MANUFACTURE OF CELLULOSE FATTY ACID ESTERS.—I. G. Farbenindustrie. May 12, 1938. 14100/39.

MANUFACTURE OF CELLULOSE DERIVATIVES.—British Celanese, Ltd. May 13, 1938. 14221/39.

PROCESS FOR LIQUATING ZINC from zinc dust and similar products containing metallic zinc.—Stolberger Zink A.-G. fur Berkbau und Huttonbetrieb and Metallges A.-G. May 20, 1938. 28640/38.

METHOD OF PRODUCING a stable fluid mixture of coal and oil.—Kohble und Eisenforschung Ges. May 23, 1938. 5398/39.

CATALYTIC TREATMENT OF HYDROCARBONS.—Standard Oil Development Co. May 18, 1938. 5750/39.

MANUFACTURE OF EMULSIONS.—Standard Oil Development Co. May 20, 1938. 8422/39.

SOLID PREPARATIONS containing free lactic acid, and processes of producing same.—E. Boehringer, A. Boehringer, J. Liebrecht, and I. Liebrecht (née Boehringer), (trading as C. H. Boehringer Sohn). April 14, 1938. 11378/39.

PROCESS FOR HYDROGENATING DISTILLATION and extraction products from coal.—Gewerkschaft M. Stinnes. May 16, 1938. 11690/39.

Specifications Accepted with Date of Application

PRODUCTION OF HETEROPOLYMERIC REACTION PRODUCTS.—A. H. Stevens (Phillips Petroleum Co.). Jan. 28, 1938. 515,196.

MOULDING OF SHEETS from plastic masses.—V. Lefebure, J. B. Sandford and Imperial Chemical Industries, Ltd. March 25, 1938. 515,299.

TREATMENT OF ZINC DUST for reducing the speed of reaction thereof in processes using it as a catalyst or reactant, and processes using zinc dust in this capacity.—Siemens and Halske A.-G. May 27, 1937. 515,156.

MANUFACTURE OF OPTICALLY-ACTIVE MENTHONES and menthols.—Howards and Sons, Ltd., J. W. Blagden and W. E. Huggett. May 26, 1938. (Cognate Application, 13206/39.) 515,171.

MANUFACTURE OF DRIERS for varnishes, lacquers, paints and plastic masses.—I. G. Farbenindustrie. May 26, 1937. 515,172.

MANUFACTURE OF CATALYSTS for cracking petroleum oils.—Standard Oil Development Co. Sept. 29, 1937. 515,309.

ANTHRAQUINONE COMPOUNDS.—S. Coffey, N. H. Haddock, C. Wood, and Imperial Chemical Industries, Ltd. May 26, 1938. (Addition to 491,493.) 515,185.

MANUFACTURE OF RESINS.—Standard Oil Development Co. Oct. 6, 1937. 515,263.

MANUFACTURE OF AROMATIC DINITRILES.—E. I. du Pont de Nemours and Co. May 29, 1937. 515,192.

ALKYLATION OF HYDROCARBONS.—Texaco Development Corporation. June 18, 1937. 515,367.

MANUFACTURE OF AMMONIUM SULPHATE.—G. Ogden and Imperial Chemical Industries, Ltd. May 30, 1938. 515,374.

MANUFACTURE OF ARYLIDES of 2 : 3 oxynaphthalene carboxylic acid and dyestuffs.—Soc. of Chemical Industry in Basle. June 2, 1937. (Cognate Application, 16241/38.) 515,381.

MANUFACTURE OF LAMINATED RESIN-IMPREGNATED MOULDINGS.—H. W. Hutton and G. R. Eyssen. May 31, 1938. 515,387.

FRACTIONAL SEPARATION of hydrocarbon vapours.—Houdry Process Corporation. July 10, 1937. 515,390.

EXTRACTION UNDER PRESSURE of solid carbonaceous materials.—J. J. V. Armstrong (N. V. Internationale Hydrogeneeringsoctrooien Maatschappij (International Hydrogenation Patents Co.)). June 20, 1938. 515,335.

PRODUCTION OF CALCIUM SULPHATE.—E. I. du Pont de Nemours and Co. Dec. 2, 1937. 515,293.

PRODUCTION OF CAST SYNTHETIC RESINS.—K. Loos. Feb. 27, 1937. (Cognate Application, 6267/38.) 515,467.

EXTRACTING AND REFINING GLYCERIDES, and products resulting therefrom.—Pittsburgh Plate Glass Co. May 22, 1937. 515,468.

PRODUCTION OF SYNTHETIC RESINS, moulding compositions and powders, and moulded articles.—F. Pollak. Feb. 4, 1938. 515,616.

THERMOPLASTIC RESINS.—M. T. Sampson and Imperial Chemical Industries, Ltd. April 2, 1938. 515,565.

PREPARATION OF HORMONES, physiologically-active sterols, and derivatives thereof.—B. P. H. Wiesner and R. Milton. May 6, 1938. 515,566.

MANUFACTURE OF MIXED RESINS for cation exchange.—I. G. Farbenindustrie. Feb. 8, 1938. 515,517.

MANUFACTURE OF QUATERNARY AMMONIUM COMPOUNDS.—Deutsche Hydrierwerke A.-G. May 27, 1937. 515,477.

MANUFACTURE OF AMMONIUM SULPHATE.—J. Beel and Imperial Chemical Industries, Ltd. May 30, 1938. 515,482.

TREATMENT OF WASTE ACIDS containing nitric acid.—H. Pauling. May 31, 1938. 515,429.

TREATMENT OF HYDROCARBON OIL.—Texaco Development Corporation. June 18, 1937. 515,531.

PRODUCTION OF ETHYLENE OXIDE.—U.S. Industrial Alcohol Co. June 24, 1937. 515,570.

ARTIFICIAL FILAMENTS derived from nitro-cellulose.—R. Wallach. June 3, 1938. 515,573.

Weekly Prices of British Chemical Products

ACTIVE conditions have been in evidence during the past week and the movement so far as heavy chemicals are concerned has been of good dimensions. A limited volume of contract business has been placed during the first two weeks of the year, and in few cases have forward bookings been accepted beyond a three months' period. The tone of the market on the whole is decidedly firm and offers of imported materials of which the home supplies are inadequate are commanding high rates. Conditions in the market for coal tar products continue to follow an even trend with quotations steady at recent levels. The price position of crude carbolic acid 60's is reported to be firmer.

MANCHESTER.—Steady to firm price conditions have been the general rule on the Manchester chemical market during the past week and recent advances in all departments have been fully maintained. Trading has been fairly active and there has been a steady call for supplies of textile and other chemicals, with good deliveries being taken up against contracts. In the tar products section prices are firm throughout the range and most of the lighter descriptions continue to meet with a good demand.

GLASGOW.—The beginning of the year has seen very considerable change of price in all products. In many cases it has been possible to fix contracts on the same basis as in previous years and for 1940 many sellers are offering only on a spot basis. Shortage continues in waxes, Epsom salts, oxalic acid, magnesium chloride, etc. On the whole, buying has been cautious since the beginning of the month. Hyposulphite of soda, commercial quality, has been increased 17s. 6d. per ton in four-ton lots, and caustic soda £1 to £2 per ton, according to quantity and packages.

Price Changes

Rises: Benzol (industrial), Xylol (Manchester).

Falls: Creosote, home trade.

*In the case of certain products, here marked with an asterisk, the market is nominal, and the last ascertainable prices have been included.

General Chemicals

ACETIC ACID.—Maximum prices per ton: 80% technical, 1 ton, £34 15s.; 10 cwt./1 ton, £35 15s.; 4/10 cwt., £36 15s.; 80% pure, 1 ton, £36 15s.; 10 cwt./1 ton, £37 15s.; 4/10 cwt., £38 15s.; commercial glacial, 1 ton, £44; 10 cwt./1 ton, £45; 4/10 cwt., £46; delivered buyers' premises in returnable barrels. £4 per ton extra if packed and delivered in glass.

ACETONE.—Maximum prices per ton, 50 tons and over, £49 10s.; 10/50 tons, £50; 5/10 tons, £50 10s.; 1/5 tons, £51; single drums, £52, delivered buyers' premises in returnable drums or other containers having a capacity of not less than 45 gallons each; delivered in containers of less than 45 gallons but not less than 10 gallons £10 10s. per ton in excess of maximum prices; delivered in containers less than 10 gallons each £10 10s. per ton in excess of maximum prices, plus a reasonable allowance.

*ALUM.—Loose lump, £8 7s. 6d. per ton d/d.

*ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—99.95%, 1s. to 2s. per lb. according to quantity in loaned cylinders, carriage paid; less for important contracts.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—Grey galvanising, £18 per ton, in casks, ex wharf. See also Salammoniac.

*ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—99/100%, about £25 per ton, ex store

BARIUM CHLORIDE.—98/100%, prime white crystals, about £11 per ton when available, bag packing, ex works; imported material would be dearer.

BLEACHING POWDER.—Spot, 35/37% £9 5s. per ton in casks, special terms for contract.

BORAX, COMMERCIAL.—Granulated, £20 10s. per ton; crystal, £21 10s.; powdered, £22; extra finely powdered, £23; B.P. crystals, £29 10s.; powdered, £30; extra fine, £31 per ton for ton lots in free 1-cwt. bags, carriage paid in Great Britain. Borax Glass, lump, £64; powder, £65; in tin-lined cases for home trade only, packages free, carriage paid in Great Britain.

BORIC ACID.—Commercial granulated, £34 10s. per ton; crystal, £35 10s.; powdered, £36 10s.; extra finely powdered, £38 10s.; large flakes, £47; B.P. crystals, £43 10s.; powdered, £44 10s.; extra fine powdered, £46 10s. per ton for ton lots, in free 1-cwt. bags, carriage paid in Great Britain.

CALCIUM BISULPHITE.—£7 10s. per ton f.o.r. London.

*CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL LUMP.—£7 5s. to £11 per ton, ex wharf. Granulated £7 to £9 per ton according to grade and locality.

*CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4⅝d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 3½d. per lb.; liquor, £19 10s. per ton d/d station in drums.

CHROMIC ACID.—10¾d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—1s. 1d. per lb., d/d U.K.

CITRIC ACID.—1s. 1½d. per lb. MANCHESTER: 1s. 3d.

*COPPER SULPHATE.—Nominal.

CREAM OF TARTAR.—100%, £5 2s. to £5 7s. per cwt., less 2½%. Makers' prices nominal, imported material about £170 per ton.

FORMALDEHYDE.—40% by volume, £23 5s. to £25 per ton, according to quantity, d/d in sellers' returnable casks.

FORMIC ACID.—85%, £44 10s. per ton for ton lots, carr. paid, carboys returnable; smaller parcels quoted at 46s. 6d. to 49s. 6d. per cwt., ex store.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HEXAMINE.—Technical grade for commercial purposes, 1s. 4d. per lb.; free-running crystals are quoted at 1s. 7d. per lb.; carriage paid for bulk lots.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 11s. 2d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £30 10s. per ton; 50% by weight, £35; 80% by weight, £60; pale tech., 50% by vol., £36; 50% by weight, £42; 80% by weight, £67. One ton lots ex works; barrels returnable.

LEAD ACETATE.—White, £48 to £50, ton lots.

LEAD NITRATE.—About £40 per ton in casks.

LEAD, RED.—English, 5/10 cwt., £41 10s.; 10 cwt. to 1 ton, £41 5s.; 1/2 tons, £41; 2/5 tons, £40 10s.; 5/20 tons, £40; 20/100 tons, £39 10s.; over 100 tons, £39 per ton, less 2½ per cent., carriage paid; non-setting red lead, 10s. per ton dearer in each case; Continental material, £1 per ton cheaper.

LEAD, WHITE.—Dry English, less than 5 tons, £51; 5/15 tons, £47; 15/25 tons, £46 10s.; 25/50 tons, £46; 50/200 tons, £45 10s. per ton, less 5% carriage paid; Continental material, £1 per ton cheaper. Ground in oil, English, 1/5 cwt., £59; 5/10 cwt., £58; 10 cwt. to 1 ton, £57 10s.; 1/2 tons, £56; 2/5 tons, £55; 5/10 tons, £53; 10/15 tons, £52; 15/25 tons, £51 10s.; 25/50 tons, £51; 50/100 tons, £50 10s. per ton, less 5% carriage paid. Continental material £2 per ton cheaper.

LITHARGE.—10 cwt.-1 ton, £34 15s. per ton.

MAGNESITE.—Calcined, in bags, ex works, about £9 to £10 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf), £10 per ton.

*MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf

MERCURY PRODUCTS.—Controlled prices for 1 cwt. quantities: Bichloride powder, 7s. 5d.; bichloride lump, 8s.; bichloride ammon. powder, 8s. 11d.; bichloride ammon. lump, 8s. 9d.; mercurous chloride, 8s. 11d.; mercury oxide, red cryst., B.P., 10s. 3d.; red levig. B.P., 9s. 9d.; yellow levig. B.P., 9s. 7d.

*METHYLATED SPIRIT.—61 O.P., industrial, 1s. 5d. to 2s per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

*NITRIC ACID.—Spot, £25 to £30 per ton, according to strength, quantity and destination.

OXALIC ACID.—£59 5s. per ton for ton lots, carriage paid, in 5-cwt. casks; smaller parcels, 59s. 9d. to 60s. per cwt., ex store; deliveries slow.

*PARAFFIN WAX.—GLASGOW: 3¾d. per lb.

POTASH, CAUSTIC.—Liquid, £25 to £30 per ton, according to quantity.

POTASSIUM BICHROMATE.—5¾d. per lb. carriage paid. GLASGOW: 5¾d. per lb., carriage paid.

POTASSIUM CHLORATE.—Imported powder and crystals, ex store London, 10d. to 1s. per lb.

POTASSIUM IODIDE.—B.P., 9s. 10½d. per lb. in 7 lb. lots; for not less than 1 cwt., 7s. 9d. per lb.

POTASSIUM NITRATE.—Small granular crystals, £26 to £29 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—B.P. 1s. 3½d. per lb.; commercial, 143s. per cwt., d/d.

POTASSIUM PRUSSIATE.—Yellow, about 1s. 8d. per lb., supplies scarce.

SALAMMONIAC.—Dog-tooth crystals, £42 per ton; medium, £38; fine white crystals, £16; in casks, ex store.

SALT CAKE.—Unground, spot, £3 15s. per ton.

SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £14 per ton d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£25 to £26 per ton, ex wharf.

SODIUM BICARBONATE.—About £10 10s. to £11 10s. per ton, in bags.

SODIUM BICHROMATE.—Crystals, 4¾d. per lb., net d/d U.K. with rebates for contracts. GLASGOW: 4¾d. per lb., carriage paid.

SODIUM BISULPHITE POWDER.—60/62%. £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£27 10s. to £32 per ton, d/d according to quantity.

SODIUM HYPOSULPHITE.—Pea crystals, £15 15s. per ton for 2-ton lots; commercial, £11 15s. per ton. MANCHESTER: Commercial, £11 10s.; photographic, £16.

*SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—Refined, £8 5s. per ton for 6-ton lots d/d.

SODIUM NITRITE.—£18 5s. per ton for ton lots.

SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.

SODIUM PHOSPHATE.—Di-sodium, £16 to £17 per ton delivered for ton lots. Tri-sodium, £18 per ton delivered per ton lots.

SODIUM PRUSSIATE.—4½d. to 5½d. per lb.

SODIUM SILICATE.—£8 2s. 6d. per ton.

*SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.

*SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 15s.

SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £13; crystals, £9 15s.

*SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

*SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

TARTARIC ACID.—1s. 2½d. per lb., less 5%, carriage paid for lots of 5 cwt. and upwards. Makers' prices nominal; imported material 2s. 3d. to 2s. 6d. per lb., ex wharf. MANCHESTER: 1s. 5d. per lb.

ZINC OXIDE.—Maximum prices: White seal, £30 17s. 6d. per ton; red seal, £28 7s. 6d. d/d; green seal, £29 17s. 6d. d/d buyers' premises.

ZINC SULPHATE.—Tech., about £19 10s., carriage paid, casks free.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 9½d. to 1s. 6d. per lb., according to quality. Crimson, 1s. 7½d. to 1s. 10½d. per lb.

ARSENIC SULPHIDE.—Yellow, 1s. 6d. to 1s. 8d. per lb.

CARBON DISULPHIDE.—£25 to £30 per ton, according to quantity, in free returnable drums.

CARBON TETRACHLORIDE.—£48 to £53 per ton, according to quantity, drums extra.

CHROMIUM OXIDE.—Green, 1s. 3d. per lb.

INDIA-RUBBER SUBSTITUTES.—White, 5¾d. to 6¾d. per lb.; dark 5½d. to 6d. per lb.

LITHOPONE.—30%, £16 15s. per ton.

SULPHUR CHLORIDE.—6d. to 8d. per lb., according to quantity.

VEGETABLE BLACK.—£35 per ton upwards; 28/30%, £15 10s. 0d.; 60%, £29, delivered buyers' premises.

ZINC SULPHIDE.—About £63 per ton ex works.

Plus 5% War Charge.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—Per ton in 6-ton lots d/d farmer's nearest station up to January 31, 1940, £9; February, £9 3s.; March/June, £9 6s.

CALCIUM CYANAMIDE.—£12 10s. for 5-ton lots per ton net f.o.r. or ex store, London. Supplies small.

"NITRO-CHALK."—£8 18s. per ton, in 6-ton lots, d/d farmer's nearest station, January/June delivery.

CONCENTRATED COMPLETE FERTILISERS.—£11 18s. to £12 4s. per ton in 6-ton lots, d/d farmer's nearest station.

AMMONIUM PHOSPHATE FERTILISERS.—£11 14s. to £16 6s. per ton in 6-ton lots, d/d farmer's nearest station.

Coal Tar Products

BENZOL.—Industrial (containing less than 2% of toluol), 2s. to 2s. 1d. per gal., ex works, nominal.

CARBOLIC ACID.—Crystals, 10d. to 10½d. per lb.; Crude, 60's 3s. 3d. to 3s. 6d., according to specification. MANCHESTER: Crystals, 9½d. to 10½d. per lb., d/d; crude, 3s. 6d. to 3s. 9d.; naked, at works.

CREOSOTE.—Home trade, 5d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 4½d. to 6½d.

CRESYLIC ACID.—99/100%, 2s. 9d. to 3s. 3d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 3s.

NAPHTHA.—Solvent, 90/160°, 1s. 8d. to 1s. 9d. per gal.; solvent, 95/160°, 1s. 11d. to 2s., naked at works; heavy, 90/190°, 1s. 4d. to 1s. 5d. per gal., naked at works, according to quantity. MANCHESTER: 90/160°, 1s. 6½d. to 1s. 9d. per gal.

NAPHTHALENE.—Crude, whizzed or hot pressed, £8 15s. to £10 15s. per ton; purified crystals, £16 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £17 to £18.

PITCH.—Medium, soft, 32s. 6d. per ton, f.o.b. MANCHESTER: 37s. 6d. to 40s., f.o.b. East Coast

PYRIDINE.—90/140°, 17s. to 19s. per gal.; 90/160°, 14s. to 16s.; 90/180°, 3s. to 4s. 6d. per gal., f.o.b. MANCHESTER: 17s. to 19s. 6d. per gal.

TOLUOL.—90%, 2s. 3d. per gal.; pure, 2s. 5d., nominal. MANCHESTER: Pure, 2s. 9d. per gal., naked.

XYLOL.—Commercial, 2s. 6d. to 2s. 11d. per gal.; pure, 2s. 8d. to 3s. 2d. MANCHESTER: 2s. 9d. per gal.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £7 5s. to £8 per ton; grey, £10 to £12. MANCHESTER: Grey, £14.

METHYL ACETONE.—40.50%, £35 to £38 per ton.

WOOD CREOSOTE.—Unrefined, 1s. to 1s. 3d. per gal., according to boiling range.

WOOD NAPHTHA, MISCIBLE.—3s. 7d. to 4s. per gal.; solvent, 4s. to 4s. 6d. per gal.

WOOD TAR.—£4 to £5 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—1s. 10d. per lb., for cwt. lots, net packages.

BENZIDINE, HCl.—2s. 7d. per lb., 100% as base, in casks.

BENZOIC ACID, 1914 B.P. (ex toluol).—1s. 11d. per lb. d/d buyer's works.

m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.

o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.

p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.

DICHLORANILINE.—2s. 1½d. to 2s. 7d. per lb.

DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.

DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 11½d.

DIPHENYLAMINE.—Spot, 2s. 3d. per lb.; d/d buyer's works.

GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.

H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.

NAPHTHIONIC ACID.—1s. 10d. per lb.

β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.

α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.

β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.

NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.

o-NITRANILINE.—4s. 3½d. per lb.

m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 10d. to 2s. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5½d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.

NITRONAPHTHALENE.—10d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

SULPHANILIC ACID.—Spot, 8¾d. per lb. 100%, d/d buyer's works.

o-TOLUIDINE.—11d. per lb., in 8/10 cwt. drums, drums extra.

p-TOLUIDINE.—2s. per lb., in casks.

m-XYLIDINE ACETATE.—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON.—For the period ending February 3, per ton, net, naked, ex works, mills, or refinery, and subject to additional charges, according to package and location of supplies:—LINSEED OIL, raw, £40 10s. RAPESEED OIL, crude, £44 5s. COTTONSEED OIL, crude, £26; washed, £28 15s.; refined edible, £29 12s. 6d.; refined deodorised, £30 10s.. SOYA BEAN OIL, crude, £27; refined deodorised, £31. COCONUT OIL, crude, £22 2s. 6d.; refined deodorised, £25 7s. 6d. PALM KERNEL OIL, crude, £21 10s.; refined deodorised, £24 15s. PALM OIL, refined deodorised, £27. GROUNDNUT OIL, crude, £29 10s.; refined deodorised, £34. WHALE OIL, crude, hardened 42 deg., £24 10s.; refined hardened 42 deg. £27. ACID OILS.—Groundnut, £20; soya, £18; coconut and palm kernel, £18 10s. Non-controlled commodities were nominally unaltered. ROSIN, 25s. to 35s. per cwt., ex wharf, according to grade. TURPENTINE, 59s. 6d. per cwt., spot, American, including tax, ex wharf, barrels and ex discount.

New Companies Registered

Associated Plastics, Ltd. (358,231).—Private company. Capital, £100 in £1 shares. To carry on the business of chemists, chemical manufacturers and manufacturers of and dealers in plastics, fire cements, paints, protective finishes, etc. Directors: Albert H. Rawnsley, Peter Spence Taylor. Registered office: 36 High Street, Smethwick.

Platarg Manufacturing Company, Ltd. (358,251).—Private company. Capital, £100 in £1 shares. To carry on the business of refiners of gold, platinum, palladium and all other precious and semi-precious metals by chemical, metallurgical and electrolite or any other processes, etc. Subscribers: Josef Beim, Mrs. Edith Beim. Registered office: 33 Lonsdale Road, Barnes, S.W.13.

Bentley Maudesley and Co., Ltd. (358,099).—Private company. Capital £100 in 100 shares of £1 each. To carry on the business of manufacturing chemists, manufacturers of and dealers in salts, acids, alkalies, drugs, oils and chemical substances, etc. Subscribers: Harold Booth, 13a Old Burlington Street, W.1; Ernest C. Claydon. Solicitors: Woolfe and Woolfe, 13a Old Burlington Street, W.1.

Anglo-Continental Omnicide, Ltd. (358,110).—Private company. Capital £4,000 in 3,000 6 per cent. cumulative preference shares of £1 and 20,000 ordinary shares of 1s. To carry on the business of manufacturers and compounders of and dealers in chemicals, drugs, fertilisers, dyes, insecticides, disinfectants and medicines, etc. Directors: Nicholas G. Dracopoulos, Bertrand R. Clarke. Secretary (pro tem): H. J. Gilbert. Solicitors: Strong and Co., 61-62 Gracechurch Street, E.C.3. Registered office: Carlton House, 11a Regent Street, S.W.1.

Metallo-Chemical Refining Company, Ltd. (358,117).—Private company. Capital £10,000 in 10,000 shares of £1 each. To carry on the business of suppliers, importers, exporters, brokers and manufacturers of, dealers in and agents for metals and ores, chemical and metal products of all kinds, alloys, metal salts, mica, scrap iron and steel, bullion, mercury and metallic residue, etc. Subscribers: Fdk. T. Smith, 1-2 Finsbury Square, E.C.2; Leslie Cork. The first directors are to be appointed by the subscribers. Solicitors: Herbert Oppenheimer, Nathan and Vandyk, 1-2 Finsbury Square, E.C.2.

Rysan, Ltd. (358,130).—Private company. Capital £1,000 in 1,000 shares of £1 each. To acquire the business hitherto carried on as "Rysan" by Bruce G. Campbell, at 3 Kensington Mall, Kensington, and to carry on the business of manufacturers of and wholesale and retail dealers in fluids and chemicals or other compounds, appliances, machinery, apparatus and materials, antidotes, fittings, and accessories of all kinds for use in or in connection with fire extinction, prevention and protection, and in connection with air raid precautions and gas protection, etc. Directors: Alfred J. Davis, Melvill M. Sankey, Bruce G. Campbell. Secretary: John G. A. Bickford. Registered office: 3 Kensington Mall, W.8.

Muir and Pullar, Ltd.—Private company. Capital, £1,000. To acquire the business of the firm of Muir and Pullar, Caer Chemical Works, Bridge of Allan, and to carry on the business of manufacturers of and dealers in chemicals, etc. Directors: John Muir, jun., John Lindsay Pullar. Registered office: Caer Chemical Works, Bridge of Allan, Stirlingshire. The file number is 21,262, registered in Edinburgh.

Electro Physical Laboratories (Renny and Wender), Ltd. (358,293).—Private company. Capital, £8,000 in 2,000 ordinary and 6,000 4 per cent. cumulative redeemable preference shares of £1 each. To carry on the business of manufacturers of and dealers in scientific instruments, apparatus and appliances of all kinds; to enter into contracts or arrangements with or on behalf of any Government or authority, firm, company or person, for the supply or hire of any such goods, etc. Subscribers: F. Willis, 57 Creighton Avenue, N.10, Ernest B. Godfrey. Solicitors: Bischoff Coxe and Co., 4 Great Winchester Street, E.C.

Retort Chemical Products, Ltd. (358,307).—Private company. Capital, £3,000 in 2,985 cumulative preference shares of £1 each and 300 ordinary shares of 1s. each. To carry on the business of manufacturers, producers and refiners of charcoal, carbon, chemicals, drugs, gases, oils and all other substances and by-products of wood, peat, coal, coke, shells, sawdust and other vegetable matters, buyers and sellers of timber, coal, coke, patent fuel, bricks, limestone, shells, sawdust and any other materials, etc. Subscribers: Oliver Hiles, Herbert W. Pontin. Directors: Henry Scott, Edgar Grande and Otto Sommer. Secretary: L. L. Tobin. Solicitors: Tobin & Co., 14/18 High Holborn, W.C.1. Registered office: 18 Walbrook, E.C.4.

Company News

Van den Berghs and Jurgens, Ltd., have announced payment of a tax free interim dividend of four per cent. on the ordinary shares.

Beecham Maclean Holdings, Ltd., have declared an interim dividend of 16 per cent. The following interim dividends have been declared by other companies in the Beechams group: **Macleans, Ltd.,** 18 per cent.; **Eno Proprietaries, Ltd.,** 12 per cent.; **Yeast-Vite, Ltd.,** 28 per cent.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

County Court Judgment

AISCHE, M. I., The Cedars, Alsager, consulting chemist. (C.C., 13/1/40.) £10 0s. 11d. Nov. 29.

Chemical and Allied Stocks and Shares

EARLIER in the week buoyant and active conditions ruled in most sections of the Stock Exchange, but subsequently the tendency became slightly reactionary, due to profit-taking sales. For the time being it is generally assumed that markets will continue to be governed mainly by the day-to-day trends in gilt-edged stocks, activity in which is attributed to the belief that the expected big Government loan is not likely to be long delayed.

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The majority of shares of chemical and kindred companies have been relatively steady, and in some cases prices have risen on balance. British Oxygen, Murex, and Tube Investments were higher, but Turner and Newall were out of favour, and United Molasses were slightly lower. British Aluminium had a firmer appearance at 50s., while Imperial Smelting at 13s. have held their recent gain, and General Refractories were steady at 9s. 3d. The news that steel production is running at a record level has tended to increase the belief that the products of the last-named company are probably in larger demand. Borax Consolidated deferred were more active and little changed at 25s.; the results fall to be issued next month. Small movements were shown in Imperial Chemical, and both the ordinary and preference units were around 30s. Cooper McDougall made the higher price of 22s. 6d., and Valor ordinary moved up from 21s. to 23s. 6d. British Glues were around 6s. and were firmly held.

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The fixing of cotton yarn prices tended to reduce speculative activity in textile shares, but on balance Bradford Dyers have risen 1s. to 7s. and Calico Printers and Bleachers ordinary and preference were also higher as compared with a week ago. Courtaulds were easier at 37s. 3d., but were active on the belief that the results, due next month, will show an improved dividend and justify the higher level of the shares reached in recent weeks. Other rayon shares had a less active appearance. The market is anticipating that later in the year Calico Printers may be able to start dealing with the question of preference dividend arrears.

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Iron and steel securities have shown further improvement on balance, attention being drawn to the fact that United Steel, Guest Keen and other "leaders" in this section still offer yields of around 7 per cent., which appear to be on the generous side. Richard Thomas shares attracted rather more attention in view of the news of increased activity in the tin plate trade; there is some talk of a possible resumption of preference dividends in April, but this is not generally expected. Elsewhere, among paint shares, Pinchin Johnson have been lowered from 19s. 3d. to 18s., but Wailes Dove kept at 9s. 6d., following publication of the annual results. Reckitt and Sons ordinary were 2s. higher at 97s. 6d. and Cerebos were well maintained at slightly over £8¼. Associated Cement and other cement shares had an easier appearance, while Wall Paper deferred were lowered to 17s. 6d. Dunlop Rubber were fairly steady around 30s. British Industrial Plastics were better at 2s. 1½d. Lever and Unilever showed a small gain, and British Oil and Cake Mills preferred recovered from an earlier decline, and at 38s. 3d. were the same as a week ago. Fison Packard changed hands up to 36s. An improvement from 31s. 6d. to 32s. was shown by British Match ordinary.

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Boots Drug were steady around 40s. and Beechams Pills 2s 6d. deferred, which are the subject of favourable dividend estimates in the market, were maintained at 8s. Sangers were 20s. 3d., and Timothy Whites 22s. 6d., while British Drug continued to be quoted at 21s. 3d. Elsewhere the lower interim dividend affected "Shell" ordinary, which were 76s. 10½d. xd, compared with 80s. a week ago, while most other oil shares were reactionary, Anglo-Iranian having gone back to 55s. and Burmah Oil to 61s. 10½d. Trinidad Leaseholds at 73s. 9d. were, however, slightly better as compared with a week ago.